SAMPLING AND ANALYSIS PLAN

PHASE 2 TSCA REMEDIATION
RIVERBANK ARMY AMMUNITION PLANT

Riverbank, California

February 2015

Prepared for

Riverbank Local Redevelopment Authority
Riverbank, California

Prepared by

Weston Solutions, Inc.
1340 Treat Blvd, Suite 210
Walnut Creek, California 94597-7580
WDCN 4051

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ABBREVIATIONS AND ACRONYMS

$\mu g/100cm^2$	micrograms per 100 square centimeters
COC	chain-of-custody
EDD	electronic data deliverable
EPA	United States Environmental Protection Agency
LCD	laboratory control duplicate
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
mg/kg	milligrams per kilogram
PCB	polychlorinated biphenyl
PPE	personal protective equipment
ppm	parts per million
QC	quality control
RBAAP	Riverbank Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
RLRA	Riverbank Local Redevelopment Authority
RPD	relative percent difference
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SL	screening level
TSCA	Toxic Substances Control Act
VSP	Visual Sample Plan

1. PURPOSE

The purpose of this Sampling and Analysis Plan (SAP) is to define the types of samples to be collected as part of a TSCA risk-based cleanup to remediate the interior building structures and floors within buildings constructed with Galbestos panels. Galbestos panels were used for siding and roofing in the construction of several buildings at the former Riverbank Army Ammunition Plan (RBAAP) located in Riverbank, California (Figure 1). The majority of these buildings and associated courtyards are located within the Production Area of the former RBAAP (Figure 2).

Galbestos is also known as Robertson Protected Metal manufactured by H. H. Robertson Co. It consists of a galvanized steel metal product coated under heat and pressure by a thick envelope of specially refined asphalt, now known to have contained polychlorinated biphenyls (PCBs), and bonded under pressure with a coat of heavy asbestos felt along with an application of a waterproof sealing coat The Galbestos panels at the former RBAAP are suspected to be the primary source of non-liquid PCB contamination found in dust, painted surfaces, and concrete floors within the buildings. To address a portion of this contamination, a Toxic Substances Control Act (TSCA) risk-based cleanup was performed in 2013 and 2014 (Phase 1) to remove and dispose of PCB-contaminated personal property and certain fixed equipment.

Remediation of the interior building structures and floors, removal of the Galbestos panels (siding and roofing), filling/covering interior building pits and trenches, and disposal or cleaning/encapsulation of PCB-impacted equipment remaining after Phase 1 work, will be performed as part of a Phase 2 TSCA risk-based cleanup. Procedures for sample collection, data evaluation and management, and information on work sequence, approach and schedule, are provided by this SAP.

The cleaning and sampling procedures described in this SAP are based on the *Request for TSCA Risk-Based Approval; Phase 2 Clean-up of PCB Contamination of Real Property to Include Buildings Exteriors and Fixed Equipment at the former Riverbank Army Ammunition Plant, Letter to Ms. Carmen Santos, Regional PCB Coordinator, U.S. Environmental Protection Agency, dated June 26, 2013* (Appendix A). The EPA approval documentation will be included in Appendix A when available.

2. SCOPE OF WORK SUMMARY

A detailed description of the RBAAP Phase 2 work and anticipated schedule are provided in the Work Sequence and Approach, Appendix B. The removal of Galbestos panels and their disposition at a TSCA-approved landfill will be conducted without sampling as the PCB concentrations in the panels are expected to exceed 50 milligram per kilogram (mg/kg). Encapsulation to address PCBs in paint on fixed equipment to remain will also not require sampling. The RBAAP Phase 2 work elements that will require sampling and analysis include the following:

- Removing residue, fixtures, and/or equipment from pits and trenches and cleaning concrete surfaces prior to installing a cover or backfilling and capping; collecting concrete samples for confirmation analysis.
- Cleaning interior building surfaces above the height of 8 feet (walls, columns, and the steel superstructure); collecting wipe samples of the surface for confirmation analysis.
- Removing paint from concrete walls, columns and the steel superstructure to a height of 8 feet from the floor; collecting wipe samples of the surface for confirmation analysis.
- Remediating concrete floors in areas with sample total PCB concentrations exceeding the cleanup level; collecting concrete samples for confirmation analysis. Characterization sampling of the concrete floors has been completed in September 2014; sample locations are shown on Figure 2 and results are discussed in Section 2.4.
- Galbestos panel removal; final surface cleaning and confirmation wipe sample analysis of interior building elements will be conducted as required.
- Characterization sampling for disposal of equipment or building decontamination wastes will be conducted as required by TSCA and the receiving facility.

Section 3 provides the rationale for confirmation sampling frequencies and cleanup levels for various media described above.

3. CONFIRMATION SAMPLING RATIONALE AND REQUIREMENTS

Confirmation sampling and analysis to verify that the cleanup levels have been attained is described in this section. To develop the rationale for sampling frequencies, the EPA freeware Visual Sample Plan (VSP) version 7 was used to calculate the number of floor confirmation samples based on hypothesis testing. The calculation is described in Section 3.4. Based on the calculated number of samples, the frequency of floor samples was determined as one per every 2,000 square feet or one every 40 feet of building length. The sampling frequency for the structural elements and trenches is also based on one sample for every 40 feet of the trench or building length. The attainment of the cleanup levels described in this section will be statistically evaluated using the EPA freeware ProUCL (Version 5.0.00 or most recent). The mean concentration of confirmation samples will be compared to the applicable cleanup level. The cleanup levels for each medium were selected based on considerations described in the following sections. Table 1 summarizes the confirmation sampling to be performed during Phase 2 work.

3.1 PITS AND TRENCHES

Cleaning of pits and trenches will include the removal of equipment (augers, where present) and removal of residue by vacuuming and/or pressure-washing. Samples will be collected from the concrete surface to document the attainment of the cleanup level at a frequency of one sample per the bottom of each pit and one sample every 40 linear feet of each trench. Results will be compared with the low-occupancy PCB cleanup standard of 25 mg/kg per 40 CFR §761.61(a)(4)(i)(B). If the mean concentration for each pit or trench is less than 25 mg/kg, the pit or trench may be filled or covered without further cleaning or remediation. If the mean concentration is greater than 25 mg/kg, the pit or trench will be addressed under the continued use provisions of the TSCA regulations of 40 CFR §761.30(p), which requires the double-wash-rinse procedures consistent with Subpart S (40 CFR §761.360-378) and either installing a cover/lid over the pit or trench or backfilling and installing a 6-inch concrete surface on top of the pit or trench (an alternative cover).

3.2 INTERIOR BUILDING SURFACES ABOVE 8 FEET

Interior surfaces above 8 feet are considered low-occupancy areas. Surfaces that are accessible with the Galbestos panels in place will be cleaned using vacuuming, pressure washing and/or hand wiping to remove dust that may contain PCBs. Confirmation wipe samples will be randomly collected from the building columns, walls or superstructure at a frequency of one sample per every 40 feet of building length. Results will be statistically evaluated using the EPA's freeware ProUCL, and the mean will be compared to a conservative cleanup standard of 25 micrograms per 100 square centimeters (µg/100 cm^2). If necessary, recleaning will be performed on all surfaces within 20 feet of either side of the original sample location, and a wipe sample will be collected at a random location within the recleaned area. Recleaning and resampling will continue until the mean of the updated dataset is below the cleanup level. A deed restriction under 40 CFR § 761.61(a)(8) would be required for this area.

3.3 INTERIOR BUILDING SURFACES BELOW 8 FEET

Paint will be removed to a visually bare surface from the columns, walls, and steel structural elements below 8 feet using high-pressure water, high-pressure water with abrasive media, or mechanical means (e.g., needle guns). Confirmation wipe samples will be collected at a frequency of one sample per every 40 feet of building length. Results will be statistically evaluated using the EPA freeware ProUCL, and the mean will be compared to the high-occupancy cleanup level of 10 µg/100 cm^2. Recleaning and resampling will continue, if necessary, until the mean is below the cleanup level. Decontamination water and paint residue will be collected by vacuuming and stored for analysis and disposal.

3.4 CONCRETE FLOORS

3.4.1 Characterization Results

The PCB concentrations in concrete floors were characterized in September 2014. To develop the rationale for the sampling frequency, VSP Version 7 was used to calculate the number of floor samples based on hypothesis testing using the true average versus fixed threshold module. Thirty-nine previously collected surface concrete sample results were used as the baseline dataset. The following assumptions were made in the VSP calculations:

- Action level—Conservatively selected at 1 mg/kg, which is the self-implementing cleanup standard without further conditions (40 CFR §761.61(a)(4)(i)(A))
- Null hypothesis—Population mean (μ) exceeds the action level (H_0: μ≥1 mg/kg) until proven otherwise and the alternative hypothesis is accepted
- Alternative hypothesis—H_a: μ<1 mg/kg; the population mean is below the action level
- False rejection decision rate (alpha)—0.05
- False acceptance decision rate (beta)—0.20
- Gray region—0.2 mg/kg

Figure 3 shows a screenshot of the VSP output. VSP calculated that a minimum of 181 samples is required for making decisions on the collected data with 95% confidence. In September 2014 a total of 255 concrete surface samples were collected at the depth of 0 to 0.5 inches at locations shown on Figure 2. In general, a frequency of one concrete surface sample for approximately every 2,000 square feet of concrete in accessible areas of the Galbestos-clad buildings and courtyard areas of RBAAP. The samples were submitted to the analytical laboratory for PCB analysis using EPA Methods 8082A/3540C (Soxhlet extraction). Because the western portion of Building 3 was occupied in September 2014 and could not be sampled, twelve concrete surface samples collected in March 2014 were included in the dataset for a total of 267 samples. Tables 2 through 10 present the analytical results, which range from not detected with a reporting limit of 0.0033 mg/kg to 350 mg/kg and are distributed as follows:

- Not detected—2 samples
- Below 1 mg/kg—126 samples
- Between 1 mg/kg and 5 mg/kg—106 samples
- Between 5 mg/kg and 10 mg/kg—21 samples
- Between 10 mg/kg and 25 mg/kg—6 samples
- Between 25 mg/kg and 35 mg/kg—2 samples
- Greater than 100 mg/kg—4 samples

Hypothesis testing using ProUCL Version 5.0.00 concluded that at alpha=0.05 the null hypothesis is accepted, meaning that the mean/median total PCB concentrations is greater than the action level of 1 mg/kg.

3.4.2 Risk-Based Cleanup Standard Development

The EPA's document "Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act (TSCA)" dated November 2005 provides guidance to assist individuals engaging in PCB remediation efforts to comply with the TSCA PCB regulations, focusing on the self-implementing requirements in 40 CFR §761.61(a). This guidance also provides information on other procedures and cleanup standards determined to be acceptable by the EPA in an industrial use scenario per risk-based requirements of 40 CFR §761.61(c). Under the self-implementing requirements, the cleanup levels for porous surfaces such as concrete in high occupancy areas is less than or equal to 1 part per million, which is 1 mg/kg, for total PCBs without further conditions. A cleanup level for concrete of less than or equal to 5 mg/kg is discussed in the Site Revitalization Guidance as an example of a risk-based cleanup that EPA approved for a site that would be used as an industrial area after the cleanup was completed. The Site Revitalization Guidance also states that this risk-based approach would likely be appropriate for other sites presenting comparable exposure scenarios, such as the RBAAP.

Based on a risk-based approach, an industrial area cleanup standard for total PCBs of less than or equal to 5 mg/kg for the mean concentration in concrete with a maximum concentration not to exceed 25 mg/kg is proposed. In addition, deed restrictions would be implemented to limit property use to industrial activities only. The application of an industrial area cleanup level as presented in the Site Revitalization Guidance is considered appropriate for the RBAAP concrete floors for the following reasons:

- The property is designated for industrial use.
- The mean cleanup level of 5 mg/kg for total PCBs corresponds to a potential carcinogenic risk value within the EPA acceptable risk management range of 10^{-6} to 10^{-4}. The EPA Regional Screening Level (RSL) for total PCBs in soil at a target risk of 10^{-6} for an industrial use scenario is 1 mg/kg, which is based on screening levels (SL) of 1.6 mg/kg for ingestion, 2.8 mg/kg for dermal contact, and 29,000 mg/kg for inhalation. At a target risk level of 10^{-4}, the RSL would be 100 mg/kg with an SL of 160 mg/kg for ingestion and 280 mg/kg for dermal contact. While concrete is not soil, the use of the soil RSLs represents a conservative approach.

- The maximum concentration of 25 mg/kg for total PCBs is the TSCA low occupancy cleanup level. This self-implementing standard assumes no dermal or respiratory protection. This maximum concentration is below the EPA's SL for inhalation exposure for soil at 29,000 mg/kg assuring a low risk threshold of 10^{-6}. It is also below the dermal SL (28 mg/kg) based on a target risk in the middle of the acceptable risk range of 10^{-5}.

Based on this risk-based approach, the concrete in floor areas with total PCB concentrations reported at levels greater than 25 mg/kg must be removed.

3.4.3 Remediation Approach

Statistical analysis was performed to determine the extent of remediation required to meet the risk-based cleanup levels. As discussed in Section 3.4.1, a total of 267 concrete surface samples were used to characterize the total PCB concentrations in the floor and courtyard areas at Galbestos-clad buildings at RBAAP. Excluding the three Galbestos-clad buildings (Buildings 11, 12, and 15) which will be evaluated separately, a total of 258 concrete surface sample locations from the Main Production Area (Figure 2) were evaluated. Six of these locations where total PCBs exceeding 25 mg/kg requiring remediation were excluded from the dataset leaving a total of 252 samples with concentrations ranging from not detected with a reporting limit of 0.0033 mg/kg to 19 mg/kg. This dataset was evaluated using the EPA's statistical software (ProUCL Version 5.0.00) to answer the following question:

> *After all locations with PCB concentrations greater than 25 mg/kg are removed, will the mean PCB concentration be less than or equal to 5 mg/kg?*

The mean total PCB concentration for the dataset of 252 samples is 2.053 mg/kg and the median is 1.015 mg/kg. Because this dataset does not follow a discernable distribution and the data are moderately to highly skewed (standard deviation of log transformed data was 1.549), nonparametric tests, Sign test and Wilcoxon Signed Rank test, were performed for the null hypothesis (H_0: $\mu \geq 5$ mg/kg) and the alternative hypothesis (H_a: $\mu < 5$ mg/kg). The conclusion at alpha = 0.05 was to reject the null hypothesis and accept the alternative hypothesis;

> *With the exclusion of the six data points exceeding 25 mg/kg, the mean total PCB concentration is 2.053 mg/kg and below the cleanup level of 5 mg/kg.*

Therefore, after remediation of six locations with total PCB concentrations greater than 25 mg/kg, the mean concrete concentration will meet the proposed risk-based cleanup standard of < 5 mg/kg.

Concrete floors will be remediated based on the characterization sample results. Six areas with the PCB concentrations exceeding 25 mg/kg (C180, C181, C182, C201, C218, and C219 shown on Figure 2) will be remediated using scabbling or equivalent methods or by complete removal and replacement of the concrete slabs. If scabbling of the concrete is implemented then confirmation samples will be collected after scabbling to confirm the PCB concentration in the concrete surface is less than 25 mg/kg. The data will be incorporated into the dataset, and the mean will be recalculated.

Mean concentrations were calculated separately for the three buildings (11, 12, and 15) outside the Main Production Area. The mean of four samples in Building 11 is 2.53 mg/kg; no further action will be necessary. The mean of two samples in Building 15 is 12.35 mg/kg. The floor in Building 15 will be remediated as described above. The average of three samples in Building 12 is 0.799 mg/kg. The floor in this building does not exceed the high occupancy area cleanup level of 1 mg/kg; no further action will be necessary.

In addition to the Main Production Area including Galbestos buildings and courtyards, Buildings 11 and 15 will also require institutional controls such as deed restriction limiting the property to industrial use only.

3.5 REMEDIATION OF EQUIPMENT FOR REUSE

Eleven fixed equipment (presses), and potentially certain non-fixed items, will be remediated for reuse. The painted surfaces will be cleaned using the double-wash-rinse procedure described in 40 CFR Part 761, Subpart S (using a terpene-hydrocarbon based solvent/degreaser); encapsulated with two layers of solvent resistant and water repellent coatings with contrasting colors, and labeled per 40 CFR § 761.30(p). Alternatively, paint may be removed by methods similar to the building surfaces below 8 feet. If the paint removal option is selected, three wipes samples will be collected from each item after removal of paint and the results of the mean compared to the PCB low-occupancy cleanup level of 10 µg/100 cm^2.

3.6 SAMPLING AFTER GALBESTOS PANEL REMOVAL

After Galbestos panels have been removed, previously inaccessible interior surfaces will be cleaned above 8 feet as described in Section 3.2 and paint will be removed from previously inaccessible structural elements below 8 feet as described in Section 3.3. Due to the smaller surface area involved, one wipe sample per 120 feet of building length will be collected from previously inaccessible areas, results incorporated into respective datasets, and the mean PCB concentration recalculated. Recleaning and resampling will continue, if necessary, until the mean concentration or the areas above 8 feet is below the cleanup level of 25 µg/100 cm^2 and the mean concentration for the areas below 8 feet is below the cleanup level of 10 µg/100 cm^2. Previously cleaned structural elements will be sampled with wipes after panel removal at a frequency every 120 feet of building length to confirm that recontamination has not occurred. Additional cleaning will be performed as needed.

3.7 WASTE SAMPLING

Wastewater used for pressure washing, decontamination, and other cleaning activities will be accumulated in a holding tank and pre-treated using a skid-mounted filtration and carbon adsorption system. To determine the appropriate disposal method, a grab sample will be collected from each wastewater batch (maximum of 20,000 gallons) and analyzed for PCBs using EPA Method 8082A and other analytes as directed by the Riverbank Wastewater Treatment Plant. Wastewater within the acceptance criterion will be discharged to the Riverbank Wastewater Treatment Plant (with approval from the facility); otherwise the wastewater will be transported to an approved disposal facility.

Spent wastewater treatment media will be disposed of as PCB remediation waste in a TSCA-approved landfill. Wastewater treatment equipment will be decontaminated in accordance with 40 CFR § 761.79. A wipe sample of the influent and effluent pipe interior will be collected for PCB analysis at the completion of the Phase 2 work. Equipment will be released for reuse if the total PCB wipe concentration is less than 10 µg/100 cm^2; otherwise the equipment will be further decontaminated until the wipe sample results are less than 10 µg/100 cm^2.

In the event that waste oil is encountered, samples will be collected and compared with the disposal criteria listed in Table 11. Miscellaneous residual hazardous materials will be packaged and/or sampled as required by the receiving facility.

Bags of bulk dust, other PCB remediation waste, and cleanup wastes may be transported to a TSCA-approved landfill without sampling (or at the minimum rate required by the landfill for profiling). Coated (painted) non-porous items (excluding electrical equipment or PCB items) and smaller uncoated metal items may also be collected for direct disposal at a TSCA-approved landfill without sampling, because these items will be assumed to be ≥ 50 mg/kg PCB remediation waste as permitted in the EPA approval.

Fixed equipment may be removed for disposal during Phase 2 activities. In lieu of sampling paint on painted items, PCB concentrations in paint may be assumed to be equal to or exceed 50 mg/kg and the item disposed of at a TSCA-approved landfill. Alternatively, PCB paint sampling may be performed to consider disposal as < 50 mg/kg PCB waste at a state-permitted solid waste landfill. Where sampling is conducted, the corresponding sampling requirements and disposal evaluation criteria are presented in Table 11.

For each batch of metal with the paint still intact, one 5-point composite paint sample will be collected for a batch of up to 250 tons. If the results are less than 50 mg/kg, the metal will be transported for disposal to a permitted state-permitted and licensed municipal solid waste landfill. If the results are greater or equal to 50 mg/kg, the waste will be transported for disposal to a TSCA-approved landfill. For each batch of unpainted metal equipment, wipe samples will be collected at a frequency of one 2-point composite sample for a batch of up to 50 tons. If the results are less than 10 µg/100 cm^2, the metal may be transported for disposal to a state-permitted and licensed municipal solid waste landfill. If the results are greater than or equal to 10 µg/100 cm^2, the waste will be transported for disposal to a TSCA-approved landfill.

Chemicals and potentially hazardous materials other than PCBs may be encountered. Recyclable materials such as lead core batteries will be reclaimed. Materials that, by their waste characteristics, are defined as RCRA-hazardous will be disposed of at an appropriate RCRA permitted facility. Qualified personnel will characterize, package, and dispose of chemicals in accordance with applicable regulations.

4. SAMPLE COLLECTION

The following types of samples are planned to be collected during Phase 2 work: wipe samples, concrete bulk samples, wastewater samples, and paint chip samples. For sample collection the following supplies will be required:

- Pre-cleaned sample containers and labels
- Paint scrapers and steel blades
- Chain-of-Custody (COC) forms
- Disposable sampling gloves
- Safety glasses and other appropriate personal protective equipment
- Paper towels
- Field log book
- Permanent marker, wax pencils, and pens
- Sample packaging and shipping supplies

4.1 WIPE SAMPLES

Wipe samples will be collected in accordance with 40 CFR § 761.123 and as described in the procedure enclosed in Appendix C.

4.2 CONCRETE BULK SAMPLES

This type of sampling will be conducted only after scabbling of concrete floors. Concrete bulk samples will be collected at a depth of 0-0.5 inches from the surface using a masonry chisel. Tools used during the sampling process will be decontaminated prior to each reuse in accordance with 40 CFR § 761.79.

4.3 WASTEWATER SAMPLES

The wastewater from cleaning or paint removal activities will not be reused but will be stored for pretreatment. To determine the appropriate disposal method, a grab sample will be collected from each wastewater tank and analyzed for PCBs using EPA Method 8082A and other parameters as required by the Riverbank Wastewater Treatment Plant. Wastewater may be discharged to the Riverbank Wastewater Treatment Plant or disposed of at an approved facility.

4.4 PAINT CHIP SAMPLES

Paint will be sampled as follows:

1. Organize the sampling supplies in a clean area in the vicinity of the sampling point.
2. Wear disposable gloves, safety glasses, and other appropriate personal protective equipment while sampling.
3. Identify the area to be sampled.
4. Scrape the area with a new or decontaminated paint scraper or blade and collect paint chip samples into a sample container. For composite samples, samples will be composited by the laboratory on a weight basis.
5. Seal the container with the lid, label it, and place it in a resealing bag inside a cooler with ice.
6. Mark the sampled equipment with a sample ID number.
7. To collect another sample, change gloves, decontaminate blade with a paper towel moistened with hexane, and repeat steps 3 through 6.
8. Complete sampling records in the field log book and fill out the COC Form.
9. Pack the samples for shipment as described in Section 8.4.
10. Ship the samples to the laboratory as soon as possible and by the fastest available delivery service.

Sampling equipment decontamination will be performed in accordance with 40 CFR § 761.79(c)(2) by either swabbing surfaces with a solvent or a double wash/rinse in a solvent. Discrete paint samples for the preparation of composites will be collected in sufficient quantities to allow preparation of paint composite samples and analysis of portions of any discrete sample as an individual sample, if necessary.

5. LABORATORY QUALIFICATIONS

The laboratory facilities that will provide analytical services for the project will be accredited under the State of California Department of Health Services Environmental Laboratory Accreditation Program and the Department of Defense Environmental Laboratory Accreditation Program. Laboratories selected for the project will be capable of providing the required turnaround time and data deliverables required by this SAP. Quality assurance personnel for the laboratory will be designated in each laboratory's Quality Assessment Manual. The analytical laboratory will designate a project manager for this project.

The laboratory will receive a copy of the SAP and its revisions and amendments. At the laboratory, the project manager is responsible for its implementation.

6. DATA QUALITY OBJECTIVES

Data collected at the RBAAP will be of sufficient quality and quantity to support the project objective, which is compliance with the Phase 2 TSCA risk-based cleanup conditions and requirements.

6.1 ANALYTICAL METHOD REQUIREMENTS

Analytical methods utilized over the course of the project will be approved by the EPA or be accepted as industry standard. The following methods of the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 (EPA, 1996), latest update, will be used in the course of the project work:

- Extraction of solid matrix (concrete)—EPA Method 3540C (Soxhlet)
- Extraction of wipes—EPA Method 3550C (ultrasonic extraction)
- Extraction of liquid matrix—EPA Methods 3510C (separatory funnel liquid-liquid extraction) or 3520C (continuous liquid-liquid extraction)
- Cleanup of extracts—EPA Method 3665A (sulfuric acid) and/or EPA Method 3660B (sulfur cleanup with copper option)
- Analysis—EPA Method 8082A for all matrices

Laboratory procedures for extraction and analysis will be available for the U.S. Army and RLRA review.

6.2 LABORATORY QUALITY CONTROL CHECKS

The recovery of known additions is a part of laboratory analytical protocols. The use of additives at known concentrations allows detecting the matrix interferences and estimating the impact of these interferences when present. It also allows evaluating the efficiency of extraction procedures and overall accuracy of analysis. Laboratory internal quality control (QC) checks will be included as applicable and appropriate per the analytical method:

- Laboratory control sample (LCS)
- Laboratory control duplicate (LCD)
- Surrogate standards
- Method and instrument blanks

Matrix spike/matrix spike duplicate samples will not be submitted for laboratory analysis during this project as inappropriate for the matrices being analyzed. Field duplicates of wipe samples will not be collected because it is impossible to wipe the same location twice. Concrete sample duplicates are also not necessary; instead, more samples were collected from the floors to better characterize the nature and extent of contamination. All decisions related to data quality will be made based on laboratory QC samples described in the following sections.

6.2.1 Laboratory Control Samples

Laboratory control samples are matrix equivalent QC check samples (such as analyte-free water) spiked with a known quantity of specific analytes that are carried through the entire sample preparation and analysis process. The spiking solution used for LCS/LCD preparation is of a source different from the stock that was used to prepare calibration standards.

For laboratory sample duplicate analyses, a sample is prepared and analyzed twice. Laboratory sample duplicates are prepared and analyzed with each batch of samples for most inorganic analyses.

Analytical accuracy will be represented by the recovery of the spiked compound in the LCS/LCD. As a general rule, the recovery of most compounds spiked into samples is expected to fall within a range of 65 to 135 percent. The laboratory will have statistically-based control limits for recovery for each method and matrix.

Analytical precision will be evaluated based on the relative percent difference (RPD) of the LCS/LCD pair. The laboratory will have statistically-based control limits for RPD established for each method of analysis and sample matrix.

6.2.2 Surrogate Standards

Organic compound analyses include the addition, quantitation, and recovery calculation of surrogate standards. Compounds selected to serve as surrogate standards must meet all of the following requirements:

- Are not the target analytes
- Do not interfere with the determination of target analytes
- Are not naturally occurring, yet are chemically similar to the target analytes
- Are compounds exhibiting similar response to target analytes

Surrogate standards are added to every analytical and QC check sample at the beginning of the sample preparation. The surrogate standard recovery is used to monitor matrix effects and losses during sample preparation. Surrogate standard control criteria are applied to all analytical and QC check samples, and if surrogate criteria are not met, re-extraction and reanalysis may be performed.

Analytical accuracy will be also evaluated based on the surrogate standard recovery. The laboratory will have statistically-based control limits for RPD established for each method of analysis and sample matrix. The surrogate standard control limits typically range from 65 to 135 percent for all organic analyses.

6.2.3 Method Blanks

A method blank is used to monitor the laboratory preparation and analysis for interferences and contamination from glassware, reagents, sample handling, and from the general laboratory environment. A method blank is carried through the entire sample preparation and analysis process, and is included with each batch of samples. Some methods of inorganic analysis do not have a distinctive preparation step. For these tests, an instrument blank, which contains all reagents used with samples, is considered to be the method blank.

6.2.4 Reporting Limits

The laboratory will determine the detection limits for each method, instrument, analyte, and matrix by using the procedure described in 40 Code of Federal Regulations Part 136, Appendix B or another scientifically valid and documented procedure. The detection limit is defined as the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99 percent level of confidence. The detection limit for wipe samples will be below 1 microgram per 100 square centimeters.

The limit of detection (LOD) is the smallest amount or concentration that must be present in a sample in order to be detected at a 99 percent confidence level. The LOD is typically two to four times the detection limit. The limit of quantitation (LOQ) is the lowest concentration of a substance that produces quantitative result within specified limit of precision and accuracy; usually set at or above the concentration of the lowest calibration standard.

Once the LOQs have been established, laboratories use them as routine reporting limits in the analysis of interference-free, undiluted samples. The LOQs, however, are highly matrix-dependent and their values increase with sample dilution. Higher reporting limits are expected for samples with matrix interferences such as paint. The LOQs provided by the laboratory will be reviewed to determine whether they are sufficiently low to support project decisions.

7. SAMPLE MANAGEMENT

7.1 SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIME

Sample containers will be 4-ounce glass jars with a Teflon-lined lid for solids and wipes. The containers provided by the laboratory will be pre-cleaned by the manufacturer according to the EPA requirements. Sample temperature preservation will include storage and transportation at ≤6 degrees Celsius. The holding time for analysis will be 14 days; extracts will be analyzed within 40 days.

7.2 SAMPLE NUMBERING AND LABELING

Samples will be uniquely designated using a numbering system that identifies a sampling point and a sample. The numbering system will be as follows: building number, sample type (C for samples of concrete, W for wipe samples), and a consecutive sample number, which will also be the location identifier. All sampling locations will be marked on building floor plans. The wipe samples and trench samples will include the nearest building column number.

For example, 6-C-070 would be a sample of concrete from Building 6 will be the seventieth sample collected during Phase 2 work. Similarly, 6-W2B-001 will be a wipe sample collected from Building 6 near Column 2B and will be the first sample collected.

Sample labels will be affixed to each sample container; non-waterproof labels will be covered with clear tape prior to sampling. Sample labels may be preprinted or prepared in the field. The following information will be recorded on the sample label:

- Project name
- Sample identification number
- Analysis to be performed
- Sampler's initials
- Sample collection date (month/day/year)
- Time of start of the sampling (24-hour clock)

7.3 SAMPLE CUSTODY

A sample is under custody, if one or more of the following criteria are met:

- It is in the sampler’s possession
- It is in the sampler’s view after being in possession
- It is in a designated secure area

In addition to providing a custody exchange record for the samples, the COC form serves as a formal request for sample analyses. Figure 4 includes an example of a COC form that may be used for the project. The COC form lists each sample, the required analyses, and the individuals or organizations performing the sample collection, shipment, and receipt. Sample custody will be the responsibility of the field crew from the time of sample collection until the samples are accepted by the laboratory courier service for delivery to the laboratory or until the samples are accepted for shipment by a commercial courier. Thereafter, the laboratory performing the analysis will maintain custody.

The COC form will be the controlling document to assure that sample custody is maintained. Sampling personnel will complete the COC form prior to transferring samples to the laboratory either by courier service or by overnight delivery service. Each time the sample custody is transferred to a different organization, the former custodian will sign the COC on the "Relinquished By" line, and the new custodian will sign the COC on the "Received By" line. The date, time and company affiliation will accompany each signature. The laboratory will immediately notify project personnel if the event the COC is broken. A decision will be made as to the fate of the sample(s) in question on a case-by-case basis. The sample(s) will either be processed "as-is" with custody failure noted along with the analytical data or rejected with resampling scheduled, if necessary. The non-conformance associated with the samples will be noted on the appropriate certificate or analysis or in a case narrative.

The COC forms will be completed, signed, and distributed as follows:

- One copy retained by the sample coordinator
- The original sent to the analytical laboratory with the sample shipment

After the laboratory receives the samples, the laboratory sample custodian will inventory each shipment before signing for it and note on the Cooler Receipt Form any discrepancy in the number of samples, temperature of the cooler or broken samples. The laboratory will immediately notify project personnel of any problems identified with the shipped samples in order to determine the appropriate course of action.

7.4 SAMPLE PACKING AND SHIPMENT

Samples to be shipped by commercial courier will be packed in sample coolers. A temperature blank will be placed in every cooler. All sample containers will be protected with bubble wrap. Ice, double-bagged in resealing bags, will be added to the cooler in sufficient quantity to keep the samples at ≤6 degrees Celsius for the duration of the shipment to the laboratory. Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage.

The COC form will be sealed in a plastic bag, and the bag will then be taped to the inside of the sample cooler lid. If several sample coolers are shipped, all of the COC forms will be enclosed in one cooler and the total number of coolers indicated in the COC form. The cooler will be taped shut with strapping tape. The samples will be shipped to the analytical laboratory by overnight delivery service. A copy of the courier shipping company waybill and copies of the COC forms will be retained for project records. Saturday deliveries will be coordinated with the laboratory.

If samples are picked up by a laboratory courier service, sample containers in resealing bags will be placed in coolers with ice. A temperature blank will be placed in every cooler. The COC form will be completed and signed by the laboratory courier.

7.5 FIELD DOCUMENTATION

Field documentation will include a Field Logbook, buildings floor plans, and preprinted COC forms. A Field Logbook with consecutively numbered pages will be assigned to this project. All entries will be recorded in indelible ink. At the end of each workday, the responsible sampler will cross out, sign, and date any unused portions of the logbook page last used. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used, and the person receiving the logbook will sign and date the next page to be used.

At a minimum, the Field Logbook will contain the following information:

- Project name and location (on the first page only)
- Date and time
- Personnel in attendance
- General weather information
- Field observations, if any
- Sampling performed
- Descriptions of deviations from the SAP, if any
- Problems encountered and corrective action taken, if any

8. DATA MANAGEMENT

Level 3 data packages are required for each test result, and higher level reporting may be requested by EPA on a sample-specific basis. All analytical data generated by the laboratory will be reviewed prior to reporting to assure their validity. This internal laboratory data review process will consist of data reduction, several levels of documented review, and reporting. Review processes will be documented using appropriate checklist forms, or logbooks, that will be signed and dated by the reviewer.

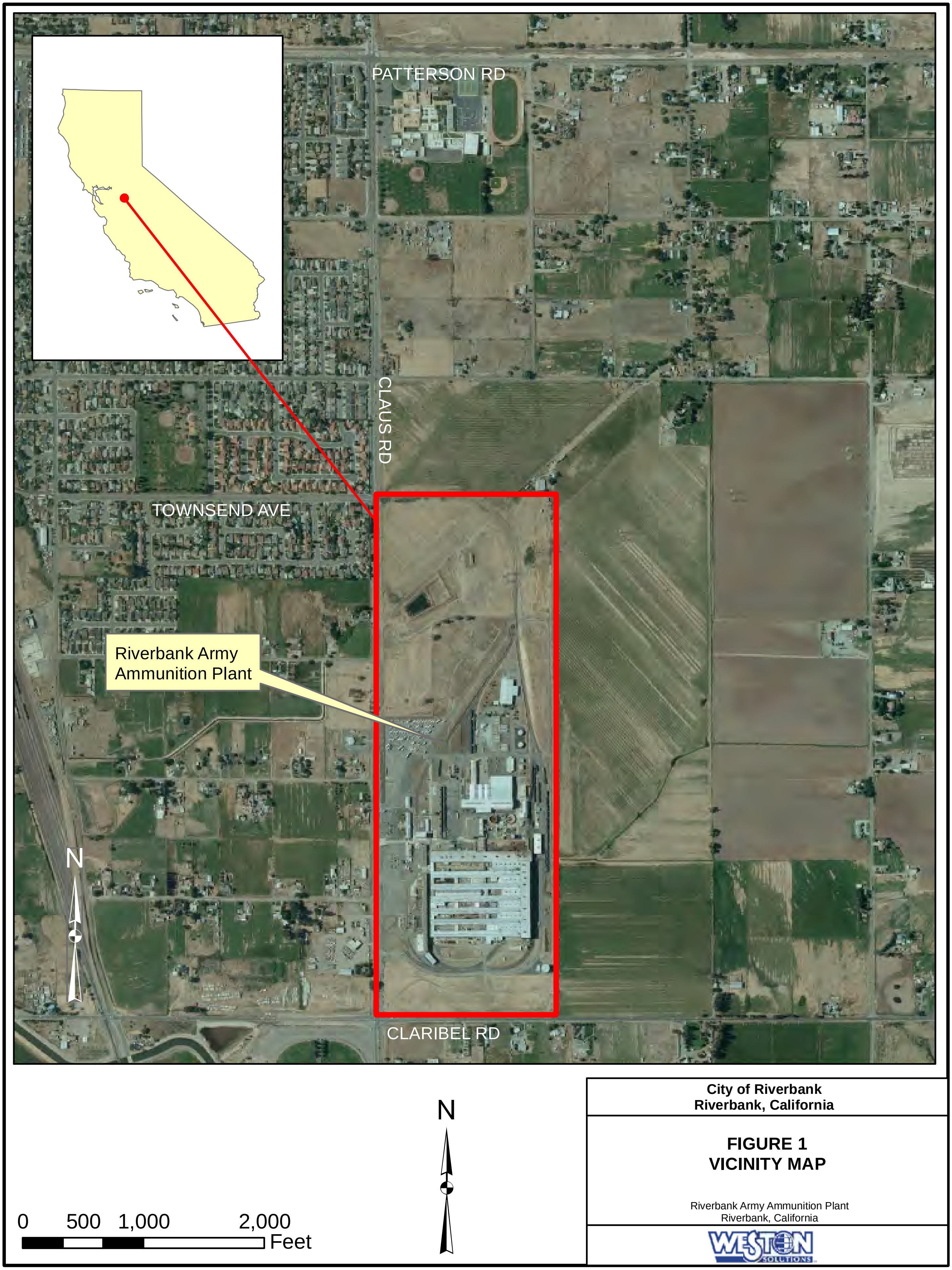
Data reduction involves the mathematical or statistical calculations used by the laboratory to convert raw data to the reported data. Reduction of analytical data will be performed by the laboratory as specified in each of the appropriate analytical methods and the laboratory standard operating procedures. For each method, all raw data results will be recorded using method-specific forms or a standardized output from each of the various instruments.

The laboratory analyst who generates the analytical data will have the primary responsibility for the correctness and completeness of data. Each step of this verification and review process will involve the evaluation of data quality based on both the results of the QC data and the professional judgment of those conducting the review. This application of technical knowledge and experience to the evaluation of data is essential in ensuring that data of known quality are generated consistently. All data generated and reduced will follow well-documented in-house protocols.

***Hard Copy Deliverables*—**All relevant raw data and documentation, including (but not limited to) logbooks, data sheets, electronic files, final reports, *etc.*, will be maintained by the laboratory for at least seven years. All data packages data will be Level 3. The data packages will be reviewed to establish with the data quality objectives were met.

***Electronic Deliverables*—**The electronic data deliverable (EDD) will be in specific file format required for data upload into an Envirodata database. The laboratory will certify that the EDD and the hard copy reports are identical. Both the EDD and the hard copy will provide results to two or three significant figures. For inorganic results, two significant figures will be used for results that are less than ten, and three significant figures will be used for results that are greater than ten. For organic results, one significant figure will be used for results that are less than ten, and two significant figures will be used for results that are greater than ten.

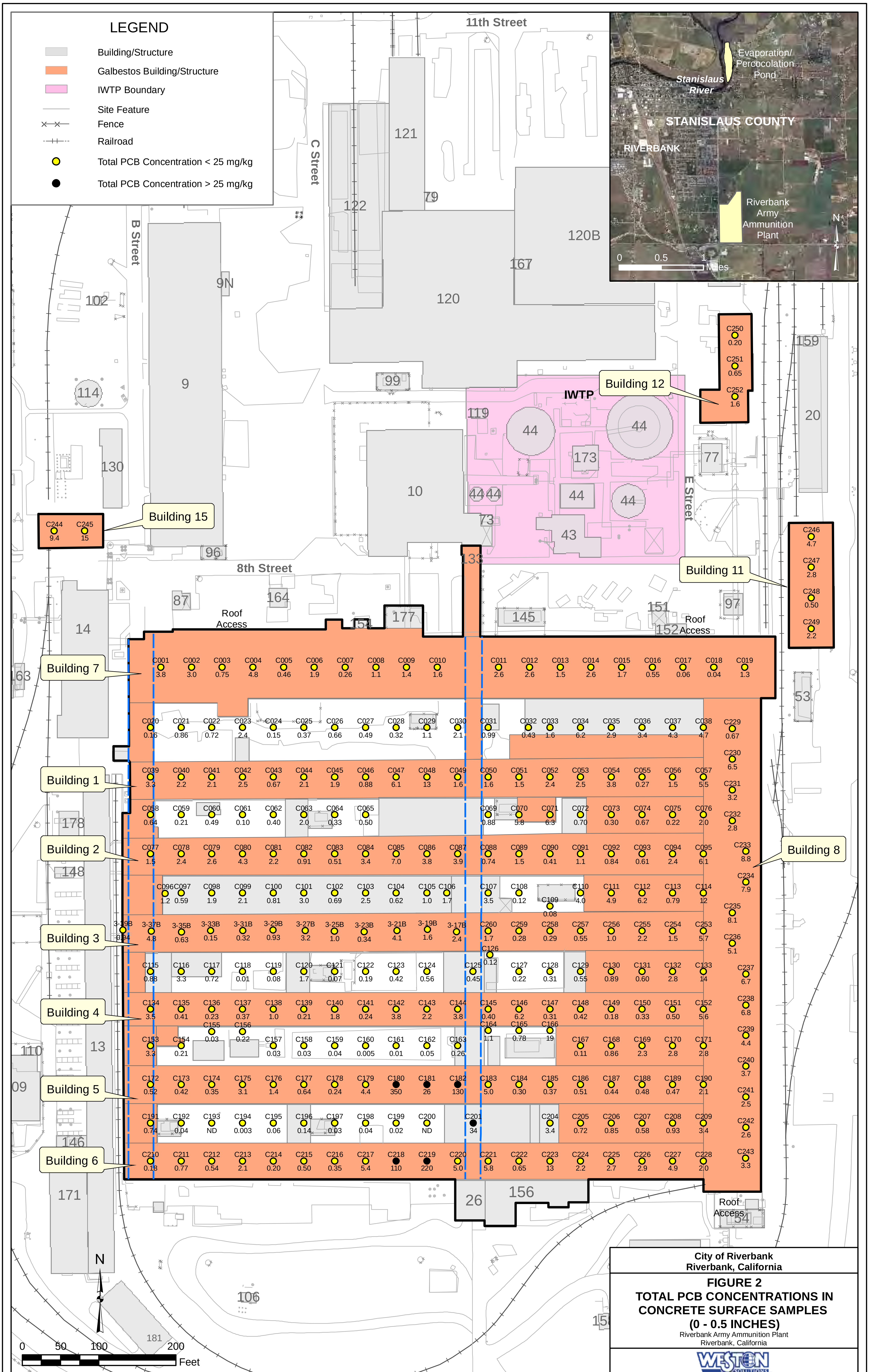
FIGURES



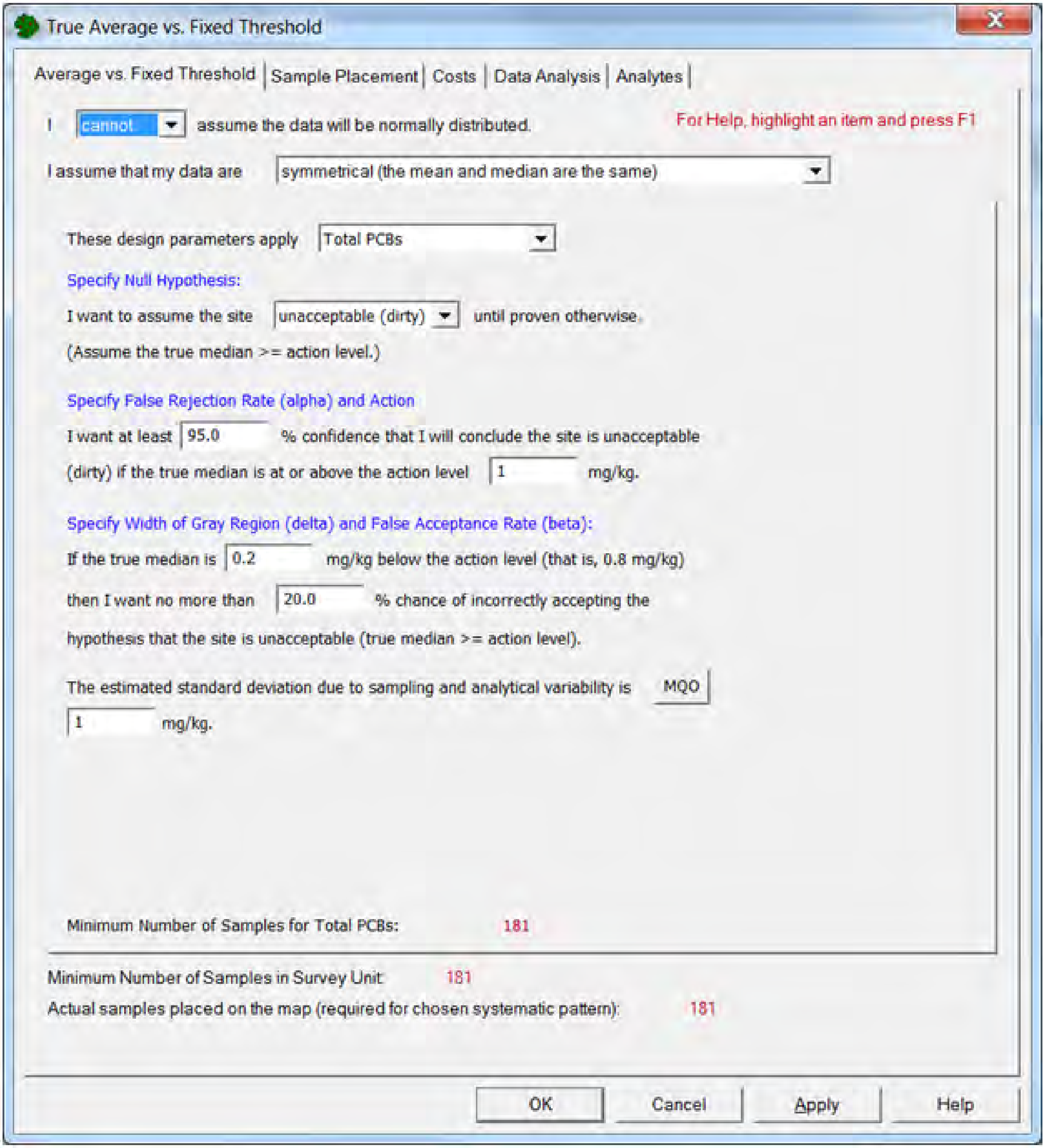
City of Riverbank
Riverbank, California

FIGURE 1
VICINITY MAP

Riverbank Army Ammunition Plant
Riverbank, California



LEGEND
Building/Structure
Galbestos Building/Structure
IWTP Boundary
Site Feature
Fence
Railroad
Total PCB Concentration < 25 mg/kg
Total PCB Concentration > 25 mg/kg
11th Street
8th Street
B Street
C Street
E Street
Evaporation/ Percocolation Pond
Stanislaus River
STANISLAUS COUNTY
RIVERBANK
Riverbank Army Ammunition Plant
0 0.5 1 Miles
IWTP
Building 1
Building 2
Building 3
Building 4
Building 5
Building 6
Building 7
Building 8
Building 11
Building 12
Building 15
Roof Access
0 50 100 200 Feet
City of Riverbank
Riverbank, California
FIGURE 2
TOTAL PCB CONCENTRATIONS IN CONCRETE SURFACE SAMPLES
(0 - 0.5 INCHES)
Riverbank Army Ammunition Plant
Riverbank, California
WESTON SOLUTIONS



City of Riverbank
Riverbank, California

FIGURE 3
VISUAL SAMPLE PLAN SCREENSHOT

Riverbank Army Ammunition Plant
Riverbank, California

WESTON SOLUTIONS

Figure 4 Example Chain-of-Custody Form

Chain-of-Custody Form

Project Number: 14972.001.001.0100.03	Project Name: Riverbank Army Ammunition Plant	Request for Analysis	Chain of Custody No.:
Sampler's *(Signature)*			Page _ of _

Field Sample ID	Date	Time	Comp.	Grab	Matrix	No. of Containers	PCBs (including 1268) EPA Method 8082									Additional Requirements

Reliquished by: *(Signature and affiliation)*	Date and Time:	Received by: (Signature and affiliation)	Date and Time:
Reliquished by: *(Signature and affiliation)*	Date and Time:	Received by: (Signature and affiliation)	Date and Time:
Reliquished by: *(Signature and affiliation)*	Date and Time:	Received by: (Signature and affiliation)	Date and Time:

Notes:

Data package: Level III

Turnaround time:

For Laboratory Use Only

TABLES

Table 1

Confirmation Sampling Requirements and Cleanup Levels

Building Element	Required Remediation	Sample Type and Frequency	PCB Cleanup Level
Pits and trenches	Removal of sediment and remaining equipment	Concrete chips from pit bottoms and at every 40 feet of trench	Mean ≤ 25 mg/kg—cover or fill without cleaning Mean > 25 mg/kg—clean, cover or fill
Interior building surfaces above 8 feet	Dust removal/surface cleaning	Wipes at every 40 feet of building length	Mean ≤ 25 µg/100 cm^2
Interior building surfaces below 8 feet	Paint removal until not visible	Wipes at every 40 feet of building length	Mean≤ 10 µg/100 cm^2
Concrete floors	Scabbling or equivalent method or removal and replacement	Concrete chips from every 2,000 square feet or every 40 feet of building length	Mean ≤ 1 mg/kg—unrestricted use Mean ≤ 5 mg/kg with the maximum concentration <25 mg/kg—deed restrictions limiting property to industrial use only
Fixed equipment for reuse	Encapsulation or paint removal	3 wipe samples per item	≤ 10 µg/100 cm^2

		Station (Site)	C039	C040	C041	C042	C043	C044
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260896-046	260896-045	260896-044	260896-043	260896-042	260896-041
Matrix: Concrete		Sample Number	1-C039	1-C040	1-C041	1-C042	1-C043	1-C044
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.034 U	0.034 U	0.033 U	0.034 U	0.033 U	0.034 U
Aroclor-1221	**5**	mg/kg	0.069 U	0.069 U	0.066 U	0.067 U	0.067 U	0.068 U
Aroclor-1232	**5**	mg/kg	0.034 U	0.034 U	0.033 U	0.034 U	0.033 U	0.034 U
Aroclor-1242	**5**	mg/kg	0.034 U	0.034 U	0.033 U	0.034 U	0.033 U	0.034 U
Aroclor-1248	**5**	mg/kg	0.11	0.11	0.14	0.094	0.25	0.034 U
Aroclor-1254	**5**	mg/kg	0.33	0.36	0.29	0.25	0.033 U	0.14
Aroclor-1260	**5**	mg/kg	1.7	0.97	1	1.2	0.32	1
Aroclor-1268	**5**	mg/kg	1.2	0.73	0.71	1	0.1	1
Total PCBs	**5**	mg/kg	3.34	2.17	2.14	2.544	0.67	2.14

Matrix: Concrete		Station (Site)	C045	C046	C047	C048	C049	C050
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260896-040	260896-039	260896-038	260896-037	260896-036	260896-035
		Sample Number	1-C045	1-C046	1-C047	1-C048	1-C049	1-C050
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.068 U	0.0095 U	0.13 U	0.13 U	0.14 U	0.0096 U
Aroclor-1221	**5**	mg/kg	0.14 U	0.019 U	0.27 U	0.26 U	0.27 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.068 U	0.0095 U	0.13 U	0.13 U	0.14 U	0.0096 U
Aroclor-1242	**5**	mg/kg	0.068 U	0.0095 U	0.13 U	0.13 U	0.14 U	0.0096 U
Aroclor-1248	**5**	mg/kg	0.068 U	0.11	0.13 U	2.4	0.64	0.0096 U
Aroclor-1254	**5**	mg/kg	0.068 U	0.14	1.9	4.7	0.23	0.16
Aroclor-1260	**5**	mg/kg	0.9	0.37	2.6	4.2	0.39	1
Aroclor-1268	**5**	mg/kg	1	0.26	1.6	2	0.29	0.43
Total PCBs	**5**	mg/kg	1.9	0.88	**6.1**	**13.3**	1.55	1.59

		Station (Site)	C051	C052	C053	C054	C055	C056
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260896-034	260896-033	260896-032	260896-031	260896-030	260896-029
Matrix: Concrete		Sample Number	1-C051	1-C052	1-C053	1-C054	1-C055	1-C056
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0096 U	0.067 U	0.034 U	0.067 U	0.0097 U	0.034 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.13 U	0.068 U	0.13 U	0.019 U	0.068 U
Aroclor-1232	**5**	mg/kg	0.0096 U	0.067 U	0.034 U	0.067 U	0.0097 U	0.034 U
Aroclor-1242	**5**	mg/kg	0.0096 U	0.067 U	0.034 U	0.067 U	0.0097 U	0.034 U
Aroclor-1248	**5**	mg/kg	0.29	0.22	0.4	0.067 U	0.018	0.034 U
Aroclor-1254	**5**	mg/kg	0.37	0.34	0.41	0.31	0.028	0.094
Aroclor-1260	**5**	mg/kg	0.48	0.97	1	1.8	0.2	0.77
Aroclor-1268	**5**	mg/kg	0.36	0.84	0.68	1.7	0.22	0.68
Total PCBs	**5**	mg/kg	1.5	2.37	2.49	3.81	0.266	1.544

		Station (Site)	C057	C058	C059	C060	C061	C062
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260896-028	260896-027	260896-026	260896-025	260896-024	260896-023
Matrix: Concrete		Sample Number	1-C057	1-C058	1-C059	1-C060	1-C061	1-C062
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.068 U	0.0098 U	0.0093 U	0.0098 U	0.0093 U	0.0094 U
Aroclor-1221	**5**	mg/kg	0.14 U	0.02 U	0.019 U	0.02 U	0.019 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.068 U	0.0098 U	0.0093 U	0.0098 U	0.0093 U	0.0094 U
Aroclor-1242	**5**	mg/kg	0.068 U	0.0098 U	0.0093 U	0.0098 U	0.0093 U	0.0094 U
Aroclor-1248	**5**	mg/kg	0.94	0.0098 U	0.0093 U	0.0098 U	0.0093 U	0.0094 U
Aroclor-1254	**5**	mg/kg	1.1	0.0098 U	0.0093 U	0.0098 U	0.0093 U	0.0094 U
Aroclor-1260	**5**	mg/kg	1.7	0.41	0.096	0.26	0.049	0.22
Aroclor-1268	**5**	mg/kg	1.8	0.23	0.11	0.23	0.047	0.18
Total PCBs	**5**	mg/kg	**5.54**	0.64	0.206	0.49	0.096	0.4

		Station (Site)	C063	C064	C065	C069	C070	C071
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260896-022	260896-021	260896-020	260896-019	260896-018	260896-017
Matrix: Concrete		Sample Number	1-C063	1-C064	1-C065	1-C069	1-C070	1-C071
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.034 U	0.0096 U	0.0095 U	0.0097 U	0.069 U	0.068 U
Aroclor-1221	**5**	mg/kg	0.068 U	0.019 U	0.019 U	0.019 U	0.14 U	0.14 U
Aroclor-1232	**5**	mg/kg	0.034 U	0.0096 U	0.0095 U	0.0097 U	0.069 U	0.068 U
Aroclor-1242	**5**	mg/kg	0.034 U	0.0096 U	0.0095 U	0.0097 U	0.069 U	0.068 U
Aroclor-1248	**5**	mg/kg	0.034 U	0.0096 U	0.0095 U	0.0097 U	0.069 U	0.068 U
Aroclor-1254	**5**	mg/kg	0.034 U	0.0096 U	0.0095 U	0.0097 U	0.069 U	2.9
Aroclor-1260	**5**	mg/kg	0.88	0.19	0.31	0.48	4.9	2.9
Aroclor-1268	**5**	mg/kg	1.1	0.14	0.19	0.4	0.85	0.54
Total PCBs	**5**	mg/kg	1.98	0.33	0.5	0.88	**5.75**	**6.34**

Matrix: Concrete		Station (Site)	C072	C073	C074	C075	C076	
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	
		Lab Number	260896-010	260896-008	260896-007	260896-006	260896-005	
		Sample Number	1-C072	1-C073	1-C074	1-C075	1-C076	
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0097 U	0.0096 U	0.0094 U	0.0095 U	0.0094 U	
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	
Aroclor-1232	**5**	mg/kg	0.0097 U	0.0096 U	0.0094 U	0.0095 U	0.0094 U	
Aroclor-1242	**5**	mg/kg	0.0097 U	0.0096 U	0.0094 U	0.0095 U	0.0094 U	
Aroclor-1248	**5**	mg/kg	0.0097 U	0.0096 U	0.039	0.031	0.16	
Aroclor-1254	**5**	mg/kg	0.0097 U	0.0096 U	0.0094 U	0.0095 U	0.0094 U	
Aroclor-1260	**5**	mg/kg	0.31	0.14	0.3	0.1	1.3	
Aroclor-1268	**5**	mg/kg	0.39	0.16	0.33	0.088	0.52	
Total PCBs	**5**	mg/kg	0.7	0.3	0.669	0.219	1.98	

J - Estimated; U - Not Detected

Matrix: Concrete		Station (Site)	C077	C078	C079	C080	C081	C082
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260896-016	260896-015	260896-014	260828-065	260828-064	260828-063
		Sample Number	2-C077	2-C078	2-C079	2-C080	2-C081	2-C082
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0094 U	0.0094 U	0.0095 U	0.033 U	0.034 U	0.0097 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.019 U	0.065 U	0.068 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.0094 U	0.0094 U	0.0095 U	0.033 U	0.034 U	0.0097 U
Aroclor-1242	**5**	mg/kg	0.0094 U	0.0094 U	0.0095 U	0.033 U	0.034 U	0.0097 U
Aroclor-1248	**5**	mg/kg	0.34	0.0094 U	0.0095 U	0.86	0.034 U	0.054
Aroclor-1254	**5**	mg/kg	0.35	0.34	0.61	0.87	0.32	0.12
Aroclor-1260	**5**	mg/kg	0.8	1.6	1.5	1.7	1.2	0.38
Aroclor-1268	**5**	mg/kg	0.33	0.42	0.45	0.88	0.65	0.36
Total PCBs	**5**	mg/kg	1.48	2.36	2.56	4.31	2.17	0.914

Matrix: Concrete		Station (Site)	C083	C084	C085	C086	C087	C088
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/11/2014
		Lab Number	260828-062	260828-061	260828-060	260828-059	260828-058	260896-013
		Sample Number	2-C083	2-C084	2-C085	2-C086	2-C087	2-C088
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0098 U	0.034 U	0.066 U	0.33 U	0.068 U	0.0097 U
Aroclor-1221	**5**	mg/kg	0.02 U	0.068 U	0.13 U	0.67 U	0.14 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.0098 U	0.034 U	0.066 U	0.33 U	0.068 U	0.0097 U
Aroclor-1242	**5**	mg/kg	0.0098 U	0.034 U	0.066 U	0.33 U	0.068 U	0.0097 U
Aroclor-1248	**5**	mg/kg	0.0098 U	0.034 U	0.92	0.37	0.16	0.0097 U
Aroclor-1254	**5**	mg/kg	0.0098 U	0.8	3	1.1	0.46	0.083
Aroclor-1260	**5**	mg/kg	0.35	1.7	2.1	1.4	1.8	0.4
Aroclor-1268	**5**	mg/kg	0.16	0.87	0.93	0.88	1.5	0.26
Total PCBs	**5**	mg/kg	0.51	3.37	**6.95**	3.75	3.92	0.743

Matrix: Concrete		Station (Site)	C089	C090	C091	C092	C093	C094
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260896-012	260896-011	260896-009	260896-004	260896-003	260896-002
		Sample Number	2-C089	2-C090	2-C091	2-C092	2-C093	2-C094
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0099 U	0.0097 U	0.0093 U	0.0094 U	0.0099 U	0.034 U
Aroclor-1221	**5**	mg/kg	0.02 U	0.019 U	0.019 U	0.019 U	0.02 U	0.068 U
Aroclor-1232	**5**	mg/kg	0.0099 U	0.0097 U	0.0093 U	0.0094 U	0.0099 U	0.034 U
Aroclor-1242	**5**	mg/kg	0.0099 U	0.0097 U	0.0093 U	0.0094 U	0.0099 U	0.034 U
Aroclor-1248	**5**	mg/kg	0.0099 U	0.0097 U	0.16	0.043	0.061	0.034 U
Aroclor-1254	**5**	mg/kg	0.29	0.0097 U	0.0093 U	0.0094 U	0.0099 U	0.034 U
Aroclor-1260	**5**	mg/kg	0.89	0.28	0.57	0.48	0.34	2
Aroclor-1268	**5**	mg/kg	0.33	0.13	0.38	0.32	0.21	0.44
Total PCBs	**5**	mg/kg	1.51	0.41	1.11	0.843	0.611	2.44

Matrix: Concrete	Cleanup Level	Station (Site) / Sample Depth, ft / Sample Date / Lab Number / Sample Number / Units	C095	C096	C097	C098	C099	C100
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/11/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260896-001	260828-057	260828-056	260828-055	260828-054	260828-053
		Sample Number	2-C095	2-C096	2-C097	2-C098	2-C099	2-C100
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.068 U	0.033 U	0.0096 U	0.033 U	0.033 U	0.0098 U
Aroclor-1221	**5**	mg/kg	0.14 U	0.067 U	0.019 U	0.066 U	0.066 U	0.02 U
Aroclor-1232	**5**	mg/kg	0.068 U	0.033 U	0.0096 U	0.033 U	0.033 U	0.0098 U
Aroclor-1242	**5**	mg/kg	0.068 U	0.033 U	0.0096 U	0.033 U	0.033 U	0.0098 U
Aroclor-1248	**5**	mg/kg	0.068 U	0.033 U	0.0096 U	0.033 U	0.033 U	0.0098 U
Aroclor-1254	**5**	mg/kg	0.068 U	0.033 U	0.0096 U	0.033 U	0.033 U	0.0098 U
Aroclor-1260	**5**	mg/kg	4.5	0.7	0.35	0.84	1.1	0.39
Aroclor-1268	**5**	mg/kg	1.6	0.53	0.24	1.1	0.95	0.42
Total PCBs	**5**	mg/kg	**6.1**	1.23	0.59	1.94	2.05	0.81

Matrix: Concrete		Station (Site)	C101	C102	C103	C104	C105	C106
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-052	260828-051	260828-050	260828-049	260828-048	260828-047
		Sample Number	2-C101	2-C102	2-C103	2-C104	2-C105	2-C106
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.066 U	0.0094 U	0.033 U	0.014 U	0.0095 U	0.027 U
Aroclor-1221	**5**	mg/kg	0.13 U	0.019 U	0.067 U	0.027 U	0.019 U	0.054 U
Aroclor-1232	**5**	mg/kg	0.066 U	0.0094 U	0.033 U	0.014 U	0.0095 U	0.027 U
Aroclor-1242	**5**	mg/kg	0.066 U	0.0094 U	0.033 U	0.014 U	0.0095 U	0.027 U
Aroclor-1248	**5**	mg/kg	0.074	0.0094 U	0.033 U	0.014 U	0.0095 U	0.027 U
Aroclor-1254	**5**	mg/kg	0.11	0.0094 U	0.033 U	0.014 U	0.0095 U	0.027 U
Aroclor-1260	**5**	mg/kg	1.6	0.35	1.2	0.3	0.54	1.2
Aroclor-1268	**5**	mg/kg	1.2	0.34	1.3	0.32	0.5	0.46
Total PCBs	**5**	mg/kg	2.984	0.69	2.5	0.62	1.04	1.66

Matrix: Concrete		Station (Site)	C107	C108	C109	C110	C111	C112
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-046	260828-045	260828-044	260828-043	260828-042	260828-041
		Sample Number	2-C107	2-C108	2-C109	2-C110	2-C111	2-C112
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.13 U	0.0097 U	0.0097 U	0.067 U	0.065 U	0.065 U
Aroclor-1221	**5**	mg/kg	0.27 U	0.019 U	0.019 U	0.13 U	0.13 U	0.13 U
Aroclor-1232	**5**	mg/kg	0.13 U	0.0097 U	0.0097 U	0.067 U	0.065 U	0.065 U
Aroclor-1242	**5**	mg/kg	0.13 U	0.0097 U	0.0097 U	0.067 U	0.065 U	0.065 U
Aroclor-1248	**5**	mg/kg	0.13 U	0.0097 U	0.0097 U	0.067 U	0.065 U	0.77
Aroclor-1254	**5**	mg/kg	1.4	0.0097 U	0.0097 U	0.067 U	0.64	1.1
Aroclor-1260	**5**	mg/kg	2.1	0.051	0.032	3	3.1	4.2
Aroclor-1268	**5**	mg/kg	0.13 U	0.067	0.045	0.96	1.2	0.065 U
Total PCBs	**5**	mg/kg	3.5	0.118	0.077	3.96	4.94	**6.17**

		Station (Site)	C113	C114				
		Sample Depth, ft	0 - 0.5	0 - 0.5				
		Sample Date	9/10/2014	9/10/2014				
		Lab Number	260828-040	260828-039				
Matrix: Concrete		Sample Number	2-C113	2-C114				
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0094 U	0.13 U				
Aroclor-1221	**5**	mg/kg	0.019 U	0.26 U				
Aroclor-1232	**5**	mg/kg	0.0094 U	0.13 U				
Aroclor-1242	**5**	mg/kg	0.0094 U	0.13 U				
Aroclor-1248	**5**	mg/kg	0.0094 U	1.4				
Aroclor-1254	**5**	mg/kg	0.11	1.7				
Aroclor-1260	**5**	mg/kg	0.49	**7.2**				
Aroclor-1268	**5**	mg/kg	0.19	1.8				
Total PCBs	**5**	mg/kg	0.79	**12.1**				

J - Estimated; U - Not Detected

Matrix: Concrete	Cleanup Level	Station (Site)	3-17B	3-19B	3-21B	3-23B	3-25B	3-27B
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	3/5/2014	3/5/2014	3/5/2014	3/5/2014	3/5/2014	3/5/2014
		Lab Number	254108-009	254108-010	254108-011	254108-012	254108-013	254108-014
		Sample Number	3-17B	3-19B	3-21B	3-23B	3-25B	3-27B
Parameters		**Units**						
Aroclor-1016	**5**	mg/kg	0.016 U	0.017 U	0.042 U	0.012 U	0.012 U	0.042 U
Aroclor-1221	**5**	mg/kg	0.033 U	0.033 U	0.084 U	0.024 U	0.024 U	0.084 U
Aroclor-1232	**5**	mg/kg	0.016 U	0.017 U	0.042 U	0.012 U	0.012 U	0.042 U
Aroclor-1242	**5**	mg/kg	0.016 U	0.017 U	0.042 U	0.012 U	0.012 U	0.042 U
Aroclor-1248	**5**	mg/kg	0.016 U	0.017 U	0.042 U	0.012 U	0.012 U	0.042 U
Aroclor-1254	**5**	mg/kg	0.4	0.27	1.2	0.012 U	0.21	0.49
Aroclor-1260	**5**	mg/kg	1.1	0.76	1.7	0.1	0.44	1.5
Aroclor-1268	**5**	mg/kg	0.89	0.58	1.2	0.24	0.36	1.2
Total PCBs	**5**	mg/kg	2.39	1.61	4.1	0.34	1.01	3.19

Matrix: Concrete	Cleanup Level	Station (Site)	3-29B	3-31B	3-33B	3-35B	3-37B	3-39B
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	3/5/2014	3/5/2014	3/5/2014	3/5/2014	3/5/2014	3/5/2014
		Lab Number	254108-015	254108-016	254108-017	254108-018	254108-019	254108-020
		Sample Number	3-29B	3-31B	3-33B	3-35B	3-37B	3-39B
Parameters		**Units**						
Aroclor-1016	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.049 U	0.012 U
Aroclor-1221	**5**	mg/kg	0.024 U	0.024 U	0.024 U	0.024 U	0.099 U	0.024 U
Aroclor-1232	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.049 U	0.012 U
Aroclor-1242	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.049 U	0.012 U
Aroclor-1248	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.049 U	0.012 U
Aroclor-1254	**5**	mg/kg	0.13	0.012 U	0.012 U	0.073	0.67	0.08
Aroclor-1260	**5**	mg/kg	0.41	0.11	0.055	0.3	2.4	0.43
Aroclor-1268	**5**	mg/kg	0.39	0.21	0.098	0.26	1.7	0.43
Total PCBs	**5**	mg/kg	0.93	0.32	0.153	0.633	4.77	0.94

Matrix: Concrete		Station (Site)	C115	C116	C117	C118	C119	C120
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-038	260828-037	260828-036	260828-035	260828-034	260828-033
		Sample Number	3-C115	3-C116	3-C117	3-C118	3-C119	3-C120
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0097 U	0.034 U	0.0095 U	0.0095 U	0.0098 U	0.034 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.069 U	0.019 U	0.019 U	0.02 U	0.068 U
Aroclor-1232	**5**	mg/kg	0.0097 U	0.034 U	0.0095 U	0.0095 U	0.0098 U	0.034 U
Aroclor-1242	**5**	mg/kg	0.0097 U	0.034 U	0.0095 U	0.0095 U	0.0098 U	0.034 U
Aroclor-1248	**5**	mg/kg	0.086	0.034 U	0.0095 U	0.0095 U	0.0098 U	0.034 U
Aroclor-1254	**5**	mg/kg	0.16	0.57	0.0095 U	0.0095 U	0.0098 U	0.034 U
Aroclor-1260	**5**	mg/kg	0.38	1.7	0.36	0.012	0.037	0.86
Aroclor-1268	**5**	mg/kg	0.25	1	0.36	0.0095 U	0.042	0.83
Total PCBs	**5**	mg/kg	0.876	3.27	0.72	0.012	0.079	1.69

		Station (Site)	C121	C122	C123	C124	C125	C126
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-032	260828-031	260828-030	260828-029	260828-028	260828-027
Matrix: Concrete		Sample Number	3-C121	3-C122	3-C123	3-C124	3-C125	3-C126
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0096 U	0.0096 U	0.0095 U	0.0098 U	0.0096 U	0.0096 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.019 U	0.02 U	0.019 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.0096 U	0.0096 U	0.0095 U	0.0098 U	0.0096 U	0.0096 U
Aroclor-1242	**5**	mg/kg	0.0096 U	0.0096 U	0.0095 U	0.0098 U	0.0096 U	0.0096 U
Aroclor-1248	**5**	mg/kg	0.0096 U	0.0096 U	0.0095 U	0.0098 U	0.0096 U	0.0096 U
Aroclor-1254	**5**	mg/kg	0.0096 U	0.0096 U	0.0095 U	0.0098 U	0.064	0.0096 U
Aroclor-1260	**5**	mg/kg	0.036	0.077	0.18	0.24	0.24	0.055
Aroclor-1268	**5**	mg/kg	0.032	0.11	0.24	0.32	0.15	0.062
Total PCBs	**5**	mg/kg	0.068	0.187	0.42	0.56	0.454	0.117

		Station (Site)	C127	C128	C129	C130	C131	C132
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-026	260828-025	260828-024	260828-023	260828-022	260828-002
Matrix: Concrete		Sample Number	3-C127	3-C128	3-C129	3-C130	3-C131	3-C132
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0094 U	0.0098 U	0.0098 U	0.013 U	0.0096 U	0.034 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.02 U	0.02 U	0.027 U	0.019 U	0.069 U
Aroclor-1232	**5**	mg/kg	0.0094 U	0.0098 U	0.0098 U	0.013 U	0.0096 U	0.034 U
Aroclor-1242	**5**	mg/kg	0.0094 U	0.0098 U	0.0098 U	0.013 U	0.0096 U	0.034 U
Aroclor-1248	**5**	mg/kg	0.0094 U	0.0098 U	0.0098 U	0.013 U	0.0096 U	0.16
Aroclor-1254	**5**	mg/kg	0.0094 U	0.0098 U	0.0098 U	0.013 U	0.0096 U	0.29
Aroclor-1260	**5**	mg/kg	0.053	0.17	0.33	0.45	0.33	1.4
Aroclor-1268	**5**	mg/kg	0.17	0.14	0.22	0.44	0.27	0.99
Total PCBs	**5**	mg/kg	0.223	0.31	0.55	0.89	0.6	2.84

		Station (Site)	C133	C253	C254	C255	C256	C257
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014	9/11/2014
		Lab Number	260828-001	260896-047	260896-048	260896-049	260896-050	260896-051
Matrix: Concrete		Sample Number	3-C133	3-C253	3-C254	3-C255	3-C256	3-C257
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.13 U	0.066 U	0.02 U	0.033 U	0.02 U	0.0094 U
Aroclor-1221	**5**	mg/kg	0.27 U	0.13 U	0.039 U	0.067 U	0.039 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.13 U	0.066 U	0.02 U	0.033 U	0.02 U	0.0094 U
Aroclor-1242	**5**	mg/kg	0.13 U	0.066 U	0.02 U	0.033 U	0.02 U	0.0094 U
Aroclor-1248	**5**	mg/kg	0.13 U	0.5	0.12	0.13	0.059	0.038
Aroclor-1254	**5**	mg/kg	2.5	0.72	0.14	0.21	0.068	0.05
Aroclor-1260	**5**	mg/kg	**7.1**	2.5	0.74	1	0.49	0.31
Aroclor-1268	**5**	mg/kg	4	2	0.53	0.72	0.42	0.15
Total PCBs	**5**	mg/kg	**13.6**	**5.72**	1.53	2.16	1.037	0.548

Matrix: Concrete		Station (Site)	C258	C259	C260			
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5			
		Sample Date	9/11/2014	9/11/2014	9/11/2014			
		Lab Number	260896-052	260896-053	260896-054			
		Sample Number	3-C258	3-C259	3-C260			
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0096 U	0.0098 U	0.033 U			
Aroclor-1221	**5**	mg/kg	0.019 U	0.02 U	0.067 U			
Aroclor-1232	**5**	mg/kg	0.0096 U	0.0098 U	0.033 U			
Aroclor-1242	**5**	mg/kg	0.0096 U	0.0098 U	0.033 U			
Aroclor-1248	**5**	mg/kg	0.0096 U	0.0098 U	0.033 U			
Aroclor-1254	**5**	mg/kg	0.0096 U	0.0098 U	0.11			
Aroclor-1260	**5**	mg/kg	0.17	0.16	0.85			
Aroclor-1268	**5**	mg/kg	0.12	0.12	0.71			
Total PCBs	**5**	mg/kg	0.29	0.28	1.67			

J - Estimated; U - Not Detected

Matrix: Concrete		Station (Site)	C134	C135	C136	C137	C138	C139
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-021	260828-020	260828-019	260828-018	260828-017	260828-016
		Sample Number	4-C134	4-C135	4-C136	4-C137	4-C138	4-C139
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.068 U	0.0097 U	0.0093 U	0.0097 U	0.034 U	0.0093 U
Aroclor-1221	**5**	mg/kg	0.14 U	0.019 U	0.019 U	0.019 U	0.068 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.068 U	0.0097 U	0.0093 U	0.0097 U	0.034 U	0.0093 U
Aroclor-1242	**5**	mg/kg	0.068 U	0.0097 U	0.0093 U	0.0097 U	0.034 U	0.0093 U
Aroclor-1248	**5**	mg/kg	0.068 U	0.0097 U	0.0093 U	0.0097 U	0.034 U	0.0093 U
Aroclor-1254	**5**	mg/kg	0.068 U	0.0097 U	0.0093 U	0.0097 U	0.034 U	0.0093 U
Aroclor-1260	**5**	mg/kg	2.2	0.26	0.15	0.2	0.88	0.083
Aroclor-1268	**5**	mg/kg	1.3	0.15	0.075	0.17	0.74	0.13
Total PCBs	**5**	mg/kg	3.5	0.41	0.225	0.37	1.02	0.213

Matrix: Concrete		Station (Site)	C140	C141	C142	C143	C144	C145
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-015	260828-014	260828-013	260828-012	260828-011	260828-010
		Sample Number	4-C140	4-C141	4-C142	4-C143	4-C144	4-C145
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.013 U	0.0094 U	0.034 U	0.034 U	0.068 U	0.0099 U
Aroclor-1221	**5**	mg/kg	0.026 U	0.019 U	0.067 U	0.069 U	0.14 U	0.02 U
Aroclor-1232	**5**	mg/kg	0.013 U	0.0094 U	0.034 U	0.034 U	0.068 U	0.0099 U
Aroclor-1242	**5**	mg/kg	0.013 U	0.0094 U	0.034 U	0.034 U	0.068 U	0.0099 U
Aroclor-1248	**5**	mg/kg	0.013 U	0.0094 U	0.034 U	0.034 U	0.35	0.0099 U
Aroclor-1254	**5**	mg/kg	0.19	0.0094 U	0.53	0.2	0.52	0.046
Aroclor-1260	**5**	mg/kg	0.85	0.11	1.7	1.1	1.8	0.18
Aroclor-1268	**5**	mg/kg	0.72	0.13	1.6	0.91	1.1	0.17
Total PCBs	**5**	mg/kg	1.76	0.24	3.83	2.21	3.77	0.396

		Station (Site)	C146	C147	C148	C149	C150	C151
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
		Lab Number	260828-009	260828-008	260828-007	260828-006	260828-005	260828-004
Matrix: Concrete		Sample Number	4-C146	4-C147	4-C148	4-C149	4-C150	4-C151
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.067 U	0.0098 U	0.0097 U	0.0098 U	0.0096 U	0.0095 U
Aroclor-1221	**5**	mg/kg	0.13 U	0.02 U	0.019 U	0.02 U	0.019 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.067 U	0.0098 U	0.0097 U	0.0098 U	0.0096 U	0.0095 U
Aroclor-1242	**5**	mg/kg	0.067 U	0.0098 U	0.0097 U	0.0098 U	0.0096 U	0.0095 U
Aroclor-1248	**5**	mg/kg	0.71	0.0098 U	0.0097 U	0.0098 U	0.0096 U	0.0095 U
Aroclor-1254	**5**	mg/kg	1.9	0.0098 U	0.0097 U	0.0098 U	0.04	0.017
Aroclor-1260	**5**	mg/kg	2.4	0.15	0.18	0.1	0.17	0.33
Aroclor-1268	**5**	mg/kg	1.2	0.16	0.24	0.082	0.12	0.15
Total PCBs	**5**	mg/kg	**6.21**	0.31	0.42	0.182	0.33	0.497

			C152	C153	C154	C155	C156	C157
		Station (Site)	C152	C153	C154	C155	C156	C157
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/10/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260828-003	260822-055	260822-054	260822-053	260822-052	260822-051
Matrix: Concrete		Sample Number	4-C152	4-C153	4-C154	4-C155	4-C156	4-C157
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.0097 U	0.033 U	0.0095 U
Aroclor-1221	**5**	mg/kg	0.27 U	0.066 U	0.066 U	0.019 U	0.067 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.0097 U	0.033 U	0.0095 U
Aroclor-1242	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.0097 U	0.033 U	0.0095 U
Aroclor-1248	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.0097 U	0.033 U	0.0095 U
Aroclor-1254	**5**	mg/kg	0.99	0.033 U	0.033 U	0.0097 U	0.033 U	0.0095 U
Aroclor-1260	**5**	mg/kg	2.7	1.9	0.1	0.011	0.095	0.0084 J
Aroclor-1268	**5**	mg/kg	1.9	1.4	0.11	0.021	0.12	0.026
Total PCBs	**5**	mg/kg	**5.59**	3.3	0.21	0.032	0.215	0.0344

		Station (Site)	C158	C159	C160	C161	C162	C163
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-050	260822-049	260822-048	260822-047	260822-046	260822-045
Matrix: Concrete		Sample Number	4-C158	4-C159	4-C160	4-C161	4-C162	4-C163
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0096 U	0.0096 U	0.0093 U	0.0094 U	0.0097 U	0.0096 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.0096 U	0.0096 U	0.0093 U	0.0094 U	0.0097 U	0.0096 U
Aroclor-1242	**5**	mg/kg	0.0096 U	0.0096 U	0.0093 U	0.0094 U	0.0097 U	0.0096 U
Aroclor-1248	**5**	mg/kg	0.0096 U	0.0096 U	0.0093 U	0.0094 U	0.0097 U	0.0096 U
Aroclor-1254	**5**	mg/kg	0.0096 U	0.0096 U	0.0093 U	0.0094 U	0.0097 U	0.0096 U
Aroclor-1260	**5**	mg/kg	0.0094 J	0.011	0.0048 J	0.01	0.026	0.26
Aroclor-1268	**5**	mg/kg	0.02	0.024	0.0093 U	0.0094 U	0.023	0.0096 U
Total PCBs	**5**	mg/kg	0.0294	0.035	0.0048 J	0.01	0.049	0.26

		Station (Site)	C164	C165	C166	C167	C168	C169
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-044	260822-043	260822-042	260822-041	260822-040	260822-039
Matrix: Concrete		Sample Number	4-C164	4-C165	4-C166	4-C167	4-C168	4-C169
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.033 U	0.0098 U	0.34 U	0.0094 U	0.0098 U	0.069 U
Aroclor-1221	**5**	mg/kg	0.065 U	0.02 U	0.68 U	0.019 U	0.02 U	0.14 U
Aroclor-1232	**5**	mg/kg	0.033 U	0.0098 U	0.34 U	0.0094 U	0.0098 U	0.069 U
Aroclor-1242	**5**	mg/kg	0.033 U	0.0098 U	0.34 U	0.0094 U	0.0098 U	0.069 U
Aroclor-1248	**5**	mg/kg	0.033 U	0.0098 U	0.34 U	0.0094 U	0.0098 U	0.069 U
Aroclor-1254	**5**	mg/kg	0.16	0.0098 U	1.3	0.0094 U	0.088	0.11
Aroclor-1260	**5**	mg/kg	0.4	0.43	**11**	0.055	0.41	1.1
Aroclor-1268	**5**	mg/kg	0.57	0.35	**6.7**	0.051	0.36	1.1
Total PCBs	**5**	mg/kg	1.13	0.78	**19**	0.106	0.858	2.31

Matrix: Concrete		Station (Site)	C170	C171				
		Sample Depth, ft	0 - 0.5	0 - 0.5				
		Sample Date	9/9/2014	9/9/2014				
		Lab Number	260822-038	260822-037				
		Sample Number	4-C170	4-C171				
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.065 U	0.02 U				
Aroclor-1221	**5**	mg/kg	0.13 U	0.04 U				
Aroclor-1232	**5**	mg/kg	0.065 U	0.02 U				
Aroclor-1242	**5**	mg/kg	0.065 U	0.02 U				
Aroclor-1248	**5**	mg/kg	0.065 U	0.02 U				
Aroclor-1254	**5**	mg/kg	0.14	0.56				
Aroclor-1260	**5**	mg/kg	1.4	1.1				
Aroclor-1268	**5**	mg/kg	1.3	1.1				
Total PCBs	**5**	mg/kg	2.84	2.76				

J - Estimated; U - Not Detected

		Station (Site)	C172	C173	C174	C175	C176	C177
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-036	260822-035	260822-034	260822-033	260822-032	260822-031
Matrix: Concrete		Sample Number	5-C172	5-C173	5-C174	5-C175	5-C176	5-C177
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0097 U	0.0096 U	0.0093 U	0.068 U	0.034 U	0.0097 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.019 U	0.14 U	0.067 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.0097 U	0.0096 U	0.0093 U	0.068 U	0.034 U	0.0097 U
Aroclor-1242	**5**	mg/kg	0.0097 U	0.0096 U	0.0093 U	0.068 U	0.034 U	0.0097 U
Aroclor-1248	**5**	mg/kg	0.0097 U	0.0096 U	0.0093 U	0.068 U	0.034 U	0.0097 U
Aroclor-1254	**5**	mg/kg	0.034	0.0096 U	0.033	0.32	0.12	0.061
Aroclor-1260	**5**	mg/kg	0.24	0.25	0.16	1.7	0.67	0.28
Aroclor-1268	**5**	mg/kg	0.25	0.17	0.16	1.1	0.6	0.28
Total PCBs	**5**	mg/kg	0.524	0.42	0.353	3.12	1.39	0.641

		Station (Site)	C178	C179	C180	C181	C182	C183
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-030	260822-029	260822-028	260822-027	260822-026	260822-025
Matrix: Concrete		Sample Number	5-C178	5-C179	5-C180	5-C181	5-C182	5-C183
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0099 U	0.069 U	4.2 U	0.42 U	0.85 U	0.082 U
Aroclor-1221	**5**	mg/kg	0.02 U	0.14 U	8.4 U	0.83 U	1.7 U	0.16 U
Aroclor-1232	**5**	mg/kg	0.0099 U	0.069 U	4.2 U	0.42 U	0.85 U	0.082 U
Aroclor-1242	**5**	mg/kg	0.0099 U	0.069 U	4.2 U	0.42 U	0.85 U	0.082 U
Aroclor-1248	**5**	mg/kg	0.0099 U	0.069 U	4.2 U	0.42 U	0.85 U	0.082 U
Aroclor-1254	**5**	mg/kg	0.0099 U	1	**220**	**13**	**68**	1.4
Aroclor-1260	**5**	mg/kg	0.13	2	**130**	**13**	**56**	2.2
Aroclor-1268	**5**	mg/kg	0.11	1.4	4.2 U	0.42 U	**7.2**	1.4
Total PCBs	**5**	mg/kg	0.24	4.4	**350**	**26**	**131.2**	5

Matrix: Concrete		Station (Site)	C184	C185	C186	C187	C188	C189
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-024	260822-023	260822-022	260822-021	260822-020	260822-019
		Sample Number	5-C184	5-C185	5-C186	5-C187	5-C188	5-C189
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.0094 U	0.013 U	0.0096 U
Aroclor-1221	**5**	mg/kg	0.024 U	0.024 U	0.024 U	0.019 U	0.026 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.0094 U	0.013 U	0.0096 U
Aroclor-1242	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.0094 U	0.013 U	0.0096 U
Aroclor-1248	**5**	mg/kg	0.012 U	0.012 U	0.012 U	0.022	0.02	0.0096 U
Aroclor-1254	**5**	mg/kg	0.024	0.021	0.031	0.025	0.036	0.027
Aroclor-1260	**5**	mg/kg	0.17	0.18	0.27	0.28	0.2	0.28
Aroclor-1268	**5**	mg/kg	0.11	0.17	0.21	0.11	0.22	0.16
Total PCBs	**5**	mg/kg	0.304	0.371	0.511	0.437	0.476	0.467

Matrix: Concrete		Station (Site)	C190	C191	C192	C193	C194	C195
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-018	260822-017	260822-016	260822-015	260822-014	260822-013
		Sample Number	5-C190	5-C191	5-C192	5-C193	5-C194	5-C195
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.068 U	0.014 U	0.0096 U	0.0094 U	0.0097 U	0.0093 U
Aroclor-1221	**5**	mg/kg	0.14 U	0.027 U	0.019 U	0.019 U	0.019 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.068 U	0.014 U	0.0096 U	0.0094 U	0.0097 U	0.0093 U
Aroclor-1242	**5**	mg/kg	0.068 U	0.014 U	0.0096 U	0.0094 U	0.0097 U	0.0093 U
Aroclor-1248	**5**	mg/kg	0.068 U	0.014 U	0.0096 U	0.0094 U	0.0097 U	0.0093 U
Aroclor-1254	**5**	mg/kg	0.25	0.024	0.0096 U	0.0094 U	0.0097 U	0.0093 U
Aroclor-1260	**5**	mg/kg	0.98	0.31	0.019	0.0094 U	0.0033 J	0.032
Aroclor-1268	**5**	mg/kg	0.88	0.41	0.035	0.0094 U	0.0097 U	0.029
Total PCBs	**5**	mg/kg	2.11	0.744	0.044	0.0094 U	0.0033	0.061

Matrix: Concrete		Station (Site)	C196	C197	C198	C199	C200	C201
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-012	260822-011	260822-010	260822-009	260822-008	260822-007
		Sample Number	5-C196	5-C197	5-C198	5-C199	5-C200	5-C201
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0095 U	0.0098 U	0.0096 U	0.0098 U	0.0097 U	1.4 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.02 U	0.019 U	0.02 U	0.019 U	2.8 U
Aroclor-1232	**5**	mg/kg	0.0095 U	0.0098 U	0.0096 U	0.0098 U	0.0097 U	1.4 U
Aroclor-1242	**5**	mg/kg	0.0095 U	0.0098 U	0.0096 U	0.0098 U	0.0097 U	1.4 U
Aroclor-1248	**5**	mg/kg	0.0095 U	0.0098 U	0.0096 U	0.0098 U	0.0097 U	1.4 U
Aroclor-1254	**5**	mg/kg	0.0036 J	0.0098 U	0.0096 U	0.0098 U	0.0097 U	**11**
Aroclor-1260	**5**	mg/kg	0.076	0.022	0.017	0.0088 J	0.0097 U	**16**
Aroclor-1268	**5**	mg/kg	0.061	0.012	0.018	0.013	0.0097 U	**7.3**
Total PCBs	**5**	mg/kg	0.137	0.034	0.035	0.0213	0.0097 U	**34.3**

		Station (Site)	C204	C205	C206	C207	C208	C209
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-006	260822-005	260822-004	260822-003	260822-002	260822-001
Matrix: Concrete		Sample Number	5-C204	5-C205	5-C206	5-C207	5-C208	5-C209
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.034 U	0.034 U	0.0098 U	0.0097 U	0.0099 U	0.067 U
Aroclor-1221	**5**	mg/kg	0.068 U	0.068 U	0.02 U	0.019 U	0.02 U	0.13 U
Aroclor-1232	**5**	mg/kg	0.034 U	0.034 U	0.0098 U	0.0097 U	0.0099 U	0.067 U
Aroclor-1242	**5**	mg/kg	0.034 U	0.034 U	0.0098 U	0.0097 U	0.0099 U	0.067 U
Aroclor-1248	**5**	mg/kg	0.034 U	0.034 U	0.0098 U	0.0097 U	0.0099 U	0.067 U
Aroclor-1254	**5**	mg/kg	0.089	0.034 U	0.0098 U	0.0097 U	0.0099 U	0.27
Aroclor-1260	**5**	mg/kg	2.4	0.38	0.48	0.28	0.43	1.6
Aroclor-1268	**5**	mg/kg	0.87	0.34	0.37	0.3	0.5	1.5
Total PCBs	**5**	mg/kg	3.359	0.72	0.85	0.58	0.93	3.37

J - Estimated; U - Not Detected

		Station (Site)	C210	C211	C212	C213	C214	C215
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/8/2014	9/8/2014	9/8/2014	9/8/2014	9/8/2014	9/8/2014
		Lab Number	260818-019	260818-018	260818-017	260818-016	260818-015	260818-014
Matrix: Concrete		Sample Number	6-C210	6-C211	6-C212	6-C213	6-C214	6-C215
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0048 U	0.0098 U	0.01 U	0.067 U	0.0047 U	0.0049 U
Aroclor-1221	**5**	mg/kg	0.0097 U	0.02 U	0.02 U	0.13 U	0.0095 U	0.0097 U
Aroclor-1232	**5**	mg/kg	0.0048 U	0.0098 U	0.01 U	0.067 U	0.0047 U	0.0049 U
Aroclor-1242	**5**	mg/kg	0.0048 U	0.0098 U	0.01 U	0.067 U	0.0047 U	0.0049 U
Aroclor-1248	**5**	mg/kg	0.0048 U	0.0098 U	0.01 U	0.067 U	0.0047 U	0.0049 U
Aroclor-1254	**5**	mg/kg	0.013	0.023	0.015	0.081	0.016	0.029
Aroclor-1260	**5**	mg/kg	0.063	0.28	0.24	0.99	0.11	0.21
Aroclor-1268	**5**	mg/kg	0.1	0.47	0.28	1	0.074	0.26
Total PCBs	**5**	mg/kg	0.176	0.773	0.535	2.071	0.2	0.499

		Station (Site)	C216	C217	C218	C219	C220	C221
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/8/2014	9/8/2014	9/8/2014	9/8/2014	9/8/2014	9/8/2014
		Lab Number	260818-013	260818-012	260818-011	260818-010	260818-009	260818-008
Matrix: Concrete		Sample Number	6-C216	6-C217	6-C218	6-C219	6-C220	6-C221
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0049 U	0.13 U	0.68 U	3.4 U	0.034 U	0.033 U
Aroclor-1221	**5**	mg/kg	0.0097 U	0.26 U	1.4 U	6.8 U	0.068 U	0.067 U
Aroclor-1232	**5**	mg/kg	0.0049 U	0.13 U	0.68 U	3.4 U	0.034 U	0.033 U
Aroclor-1242	**5**	mg/kg	0.0049 U	0.13 U	0.68 U	3.4 U	0.034 U	0.033 U
Aroclor-1248	**5**	mg/kg	0.0049 U	0.13 U	0.68 U	3.4 U	0.034 U	0.033 U
Aroclor-1254	**5**	mg/kg	0.045	0.86	**54**	**87**	1.4	1.6
Aroclor-1260	**5**	mg/kg	0.13	2.7	**44**	**120**	2.9	2.7
Aroclor-1268	**5**	mg/kg	0.17	1.8	**12**	**12**	0.66	1.5
Total PCBs	**5**	mg/kg	0.345	**5.36**	**110**	**219**	4.96	**5.8**

Matrix: Concrete	Cleanup Level	Station (Site) / Sample Depth, ft / Sample Date / Lab Number / Sample Number	C222	C223	C224	C225	C226	C227
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/8/2014	9/8/2014	9/8/2014	9/8/2014	9/8/2014	9/8/2014
		Lab Number	260818-007	260818-006	260818-005	260818-004	260818-003	260818-002
		Sample Number	6-C222	6-C223	6-C224	6-C225	6-C226	6-C227
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0066 U	0.083 U	0.033 U	0.66 U	0.034 U	0.069 U
Aroclor-1221	**5**	mg/kg	0.013 U	0.17 U	0.067 U	1.3 U	0.067 U	0.14 U
Aroclor-1232	**5**	mg/kg	0.0066 U	0.083 U	0.033 U	0.66 U	0.034 U	0.069 U
Aroclor-1242	**5**	mg/kg	0.0066 U	0.083 U	0.033 U	0.66 U	0.034 U	0.069 U
Aroclor-1248	**5**	mg/kg	0.0066 U	0.083 U	0.033 U	0.66 U	0.034 U	0.069 U
Aroclor-1254	**5**	mg/kg	0.028	0.083 U	0.27	0.63	0.23	0.43
Aroclor-1260	**5**	mg/kg	0.35	**8.3**	0.96	1.2	1.4	2.2
Aroclor-1268	**5**	mg/kg	0.27	4.6	0.94	0.83	1.3	2.3
Total PCBs	**5**	mg/kg	0.648	**12.9**	2.17	2.66	2.93	4.93

Matrix: Concrete		Station (Site)	C228					
		Sample Depth, ft	0 - 0.5					
		Sample Date	9/8/2014					
		Lab Number	260818-001					
		Sample Number	6-C228					
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.017 U					
Aroclor-1221	**5**	mg/kg	0.034 U					
Aroclor-1232	**5**	mg/kg	0.017 U					
Aroclor-1242	**5**	mg/kg	0.017 U					
Aroclor-1248	**5**	mg/kg	0.017 U					
Aroclor-1254	**5**	mg/kg	0.068					
Aroclor-1260	**5**	mg/kg	1					
Aroclor-1268	**5**	mg/kg	0.97					
Total PCBs	**5**	mg/kg	2.038					

J - Estimated; U - Not Detected

		Station (Site)	C001	C002	C003	C004	C005	C006
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-038	260897-037	260897-036	260897-035	260897-034	260897-033
Matrix: Concrete		Sample Number	7-C001	7-C002	7-C003	7-C004	7-C005	7-C006
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.065 U	0.033 U	0.0095 U	0.034 U	0.0094 U	0.034 U
Aroclor-1221	**5**	mg/kg	0.13 U	0.067 U	0.019 U	0.069 U	0.019 U	0.068 U
Aroclor-1232	**5**	mg/kg	0.065 U	0.033 U	0.0095 U	0.034 U	0.0094 U	0.034 U
Aroclor-1242	**5**	mg/kg	0.065 U	0.033 U	0.0095 U	0.034 U	0.0094 U	0.034 U
Aroclor-1248	**5**	mg/kg	0.33	0.032 J	0.0095 U	0.034 U	0.0094 U	0.034 U
Aroclor-1254	**5**	mg/kg	0.48	0.16	0.0095 U	0.034 U	0.0094 U	0.034 U
Aroclor-1260	**5**	mg/kg	1.5	1.3	0.4	2.2	0.21	0.37
Aroclor-1268	**5**	mg/kg	1.5	1.5	0.35	2.6	0.25	1.5
Total PCBs	**5**	mg/kg	3.81	2.992	0.75	4.8	0.46	1.87

Matrix: Concrete		Station (Site)	C007	C008	C009	C010	C011	C012
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-032	260897-031	260897-030	260897-029	260897-028	260897-027
		Sample Number	7-C007	7-C008	7-C009	7-C010	7-C011	7-C012
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0097 U	0.014 U	0.034 U	0.034 U	0.034 U	0.033 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.027 U	0.069 U	0.068 U	0.068 U	0.066 U
Aroclor-1232	**5**	mg/kg	0.0097 U	0.014 U	0.034 U	0.034 U	0.034 U	0.033 U
Aroclor-1242	**5**	mg/kg	0.0097 U	0.014 U	0.034 U	0.034 U	0.034 U	0.033 U
Aroclor-1248	**5**	mg/kg	0.064	0.087	0.034 U	0.034 U	0.45	0.22
Aroclor-1254	**5**	mg/kg	0.0097 U	0.13	0.034 U	0.034 U	0.43	0.26
Aroclor-1260	**5**	mg/kg	0.14	0.44	0.77	0.75	0.76	0.86
Aroclor-1268	**5**	mg/kg	0.12	0.42	0.66	0.89	0.95	1.3
Total PCBs	**5**	mg/kg	0.26	1.077	1.43	1.64	2.59	2.64

Matrix: Concrete		Station (Site)	C013	C014	C015	C016	C017	C018
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-026	260897-025	260897-024	260897-023	260897-022	260897-021
		Sample Number	7-C013	7-C014	7-C015	7-C016	7-C017	7-C018
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.013 U	0.0099 U	0.0094 U
Aroclor-1221	**5**	mg/kg	0.27 U	0.067 U	0.067 U	0.027 U	0.02 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.013 U	0.0099 U	0.0094 U
Aroclor-1242	**5**	mg/kg	0.14 U	0.033 U	0.033 U	0.013 U	0.0099 U	0.0094 U
Aroclor-1248	**5**	mg/kg	0.14	0.46	0.13	0.013 U	0.0099 U	0.0094 U
Aroclor-1254	**5**	mg/kg	0.14 U	0.54	0.23	0.013 U	0.0099 U	0.0094 U
Aroclor-1260	**5**	mg/kg	0.54	0.71	0.53	0.22	0.026	0.019
Aroclor-1268	**5**	mg/kg	0.81	0.84	0.83	0.33	0.037	0.021
Total PCBs	**5**	mg/kg	1.49	2.55	1.72	0.55	0.063	0.04

		Station (Site)	C019	C020	C021	C022	C023	C024
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-020	260897-011	260897-010	260897-009	260897-008	260897-007
Matrix: Concrete		Sample Number	7-C019	7-C020	7-C021	7-C022	7-C023	7-C024
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.014 U	0.0097 U	0.014 U	0.013 U	0.034 U	0.0094 U
Aroclor-1221	**5**	mg/kg	0.027 U	0.019 U	0.028 U	0.027 U	0.068 U	0.019 U
Aroclor-1232	**5**	mg/kg	0.014 U	0.0097 U	0.014 U	0.013 U	0.034 U	0.0094 U
Aroclor-1242	**5**	mg/kg	0.014 U	0.0097 U	0.014 U	0.013 U	0.034 U	0.0094 U
Aroclor-1248	**5**	mg/kg	0.49	0.0097 U	0.014 U	0.013 U	0.034 U	0.0094 U
Aroclor-1254	**5**	mg/kg	0.38	0.0097 U	0.014 U	0.013 U	0.034 U	0.0094 U
Aroclor-1260	**5**	mg/kg	0.19	0.044	0.26	0.33	1.1	0.069
Aroclor-1268	**5**	mg/kg	0.27	0.12	0.6	0.39	1.3	0.085
Total PCBs	**5**	mg/kg	1.33	0.164	0.86	0.72	2.4	0.154

		Station (Site)	C025	C026	C027	C028	C029	C030
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-006	260897-005	260897-004	260897-003	260897-002	260897-001
Matrix: Concrete		Sample Number	7-C025	7-C026	7-C027	7-C028	7-C029	7-C030
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0097 U	0.0097 U	0.0096 U	0.0093 U	0.013 U	0.033 U
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.026 U	0.067 U
Aroclor-1232	**5**	mg/kg	0.0097 U	0.0097 U	0.0096 U	0.0093 U	0.013 U	0.033 U
Aroclor-1242	**5**	mg/kg	0.0097 U	0.0097 U	0.0096 U	0.0093 U	0.013 U	0.033 U
Aroclor-1248	**5**	mg/kg	0.0097 U	0.0097 U	0.0096 U	0.0093 U	0.013 U	0.033 U
Aroclor-1254	**5**	mg/kg	0.0097 U	0.0097 U	0.0096 U	0.0093 U	0.013 U	0.033 U
Aroclor-1260	**5**	mg/kg	0.19	0.37	0.26	0.16	0.61	1
Aroclor-1268	**5**	mg/kg	0.18	0.29	0.23	0.16	0.44	1.1
Total PCBs	**5**	mg/kg	0.37	0.66	0.49	0.32	1.05	2.1

Matrix: Concrete		Station (Site)	C031	C032	C033	C034	C035	C036
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-019	260897-018	260897-017	260897-016	260897-015	260897-014
		Sample Number	7-C031	7-C032	7-C033	7-C034	7-C035	7-C036
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.013 U	0.014 U	0.033 U	0.14 U	0.033 U	0.065 U
Aroclor-1221	**5**	mg/kg	0.027 U	0.028 U	0.065 U	0.27 U	0.065 U	0.13 U
Aroclor-1232	**5**	mg/kg	0.013 U	0.014 U	0.033 U	0.14 U	0.033 U	0.065 U
Aroclor-1242	**5**	mg/kg	0.013 U	0.014 U	0.033 U	0.14 U	0.033 U	0.065 U
Aroclor-1248	**5**	mg/kg	0.013 U	0.014 U	0.052	0.24	0.78	1.6
Aroclor-1254	**5**	mg/kg	0.013 U	0.014 U	0.093	0.42	0.89	0.065 U
Aroclor-1260	**5**	mg/kg	0.25	0.17	0.66	2.2	0.75	1.1
Aroclor-1268	**5**	mg/kg	0.74	0.26	0.8	3.3	0.45	0.72
Total PCBs	**5**	mg/kg	0.99	0.43	1.605	**6.16**	2.87	3.42

		Station (Site)	C037	C038				
		Sample Depth, ft	0 - 0.5	0 - 0.5				
		Sample Date	9/12/2014	9/12/2014				
		Lab Number	260897-013	260897-012				
Matrix: Concrete		Sample Number	7-C037	7-C038				
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.066 U	0.032 U				
Aroclor-1221	**5**	mg/kg	0.13 U	0.065 U				
Aroclor-1232	**5**	mg/kg	0.066 U	0.032 U				
Aroclor-1242	**5**	mg/kg	0.066 U	0.032 U				
Aroclor-1248	**5**	mg/kg	1.7	1.6				
Aroclor-1254	**5**	mg/kg	0.066 U	0.032 U				
Aroclor-1260	**5**	mg/kg	1.4	1.5				
Aroclor-1268	**5**	mg/kg	1.2	1.6				
Total PCBs	**5**	mg/kg	4.3	4.7				

J - Estimated; U - Not Detected

Matrix: Concrete		Station (Site)	C229	C230	C231	C232	C233	C234
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-070	260822-069	260822-068	260822-067	260822-066	260822-065
		Sample Number	8-C229	8-C230	8-C231	8-C232	8-C233	8-C234
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0099 U	0.14 U	0.034 U	0.033 U	0.13 U	0.13 U
Aroclor-1221	**5**	mg/kg	0.02 U	0.27 U	0.068 U	0.065 U	0.27 U	0.27 U
Aroclor-1232	**5**	mg/kg	0.0099 U	0.14 U	0.034 U	0.033 U	0.13 U	0.13 U
Aroclor-1242	**5**	mg/kg	0.0099 U	0.14 U	0.034 U	0.033 U	0.13 U	0.13 U
Aroclor-1248	**5**	mg/kg	0.0099 U	1.6	0.41	0.033 U	1.2	1.9
Aroclor-1254	**5**	mg/kg	0.0099 U	1.2	0.74	0.32	1.8	2.1
Aroclor-1260	**5**	mg/kg	0.31	2.1	1.2	1.3	3.5	2.3
Aroclor-1268	**5**	mg/kg	0.36	1.6	0.87	1.2	2.3	1.6
Total PCBs	**5**	mg/kg	0.67	**6.5**	3.22	2.82	**8.8**	**7.9**

		Station (Site)	C235	C236	C237	C238	C239	C240
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014	9/9/2014
		Lab Number	260822-064	260822-063	260822-062	260822-061	260822-060	260822-059
Matrix: Concrete		Sample Number	8-C235	8-C236	8-C237	8-C238	8-C239	8-C240
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.13 U	0.14 U	0.13 U	0.13 U	0.034 U	0.033 U
Aroclor-1221	**5**	mg/kg	0.27 U	0.27 U	0.27 U	0.27 U	0.067 U	0.067 U
Aroclor-1232	**5**	mg/kg	0.13 U	0.14 U	0.13 U	0.13 U	0.034 U	0.033 U
Aroclor-1242	**5**	mg/kg	0.13 U	0.14 U	0.13 U	0.13 U	0.034 U	0.033 U
Aroclor-1248	**5**	mg/kg	2.3	0.6	0.81	0.71	0.28	0.27
Aroclor-1254	**5**	mg/kg	2.2	1	1.7	1.3	0.38	0.44
Aroclor-1260	**5**	mg/kg	2.1	2.2	2.4	2.5	2.4	1.6
Aroclor-1268	**5**	mg/kg	1.5	1.3	1.8	2.3	1.3	1.4
Total PCBs	**5**	mg/kg	**8.1**	**5.1**	**6.71**	**6.81**	4.36	3.71

		Station (Site)	C241	C242	C243			
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5			
		Sample Date	9/9/2014	9/9/2014	9/9/2014			
		Lab Number	260822-058	260822-057	260822-056			
Matrix: Concrete		Sample Number	8-C241	8-C242	8-C243			
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.034 U	0.033 U	0.033 U			
Aroclor-1221	**5**	mg/kg	0.067 U	0.066 U	0.066 U			
Aroclor-1232	**5**	mg/kg	0.034 U	0.033 U	0.033 U			
Aroclor-1242	**5**	mg/kg	0.034 U	0.033 U	0.033 U			
Aroclor-1248	**5**	mg/kg	0.17	0.13	0.13			
Aroclor-1254	**5**	mg/kg	0.26	0.22	0.23			
Aroclor-1260	**5**	mg/kg	1.1	1.1	2			
Aroclor-1268	**5**	mg/kg	1	1.1	0.95			
Total PCBs	**5**	mg/kg	2.53	2.55	3.31			

J - Estimated; U - Not Detected

Matrix: Concrete		Station (Site)	C244	C245	C246	C247	C248	C249
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5
		Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014
		Lab Number	260897-046	260897-047	260897-042	260897-041	260897-040	260897-039
		Sample Number	15-C244	15-C245	11-C246	11-C247	11-C248	11-C249
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.13 U	0.32 U	0.069 U	0.034 U	0.0095 U	0.032 U
Aroclor-1221	**5**	mg/kg	0.26 U	0.65 U	0.14 U	0.068 U	0.019 U	0.065 U
Aroclor-1232	**5**	mg/kg	0.13 U	0.32 U	0.069 U	0.034 U	0.0095 U	0.032 U
Aroclor-1242	**5**	mg/kg	0.13 U	0.32 U	0.069 U	0.034 U	0.0095 U	0.032 U
Aroclor-1248	**5**	mg/kg	0.13 U	0.32 U	0.069 U	0.034 U	0.0095 U	0.032 U
Aroclor-1254	**5**	mg/kg	0.13 U	0.32 U	0.069 U	0.034 U	0.0095 U	0.032 U
Aroclor-1260	**5**	mg/kg	4.4	**6.1**	1	0.85	0.26	0.57
Aroclor-1268	**5**	mg/kg	5	**9.2**	3.7	1.9	0.24	1.6
Total PCBs	**5**	mg/kg	**9.4**	**15.3**	4.7	2.75	0.5	2.17

		Station (Site)	C250	C251	C252			
		Sample Depth, ft	0 - 0.5	0 - 0.5	0 - 0.5			
		Sample Date	9/12/2014	9/12/2014	9/12/2014			
		Lab Number	260897-043	260897-044	260897-045			
Matrix: Concrete		Sample Number	12-C250	12-C251	12-C252			
Parameters	**Cleanup Level**	**Units**						
Aroclor-1016	**5**	mg/kg	0.0097 U	0.0095 U	0.034 U			
Aroclor-1221	**5**	mg/kg	0.019 U	0.019 U	0.069 U			
Aroclor-1232	**5**	mg/kg	0.0097 U	0.0095 U	0.034 U			
Aroclor-1242	**5**	mg/kg	0.0097 U	0.0095 U	0.034 U			
Aroclor-1248	**5**	mg/kg	0.0097 U	0.0095 U	0.034 U			
Aroclor-1254	**5**	mg/kg	0.058	0.0095 U	0.034 U			
Aroclor-1260	**5**	mg/kg	0.093	0.39	0.35			
Aroclor-1268	**5**	mg/kg	0.045	0.26	1.2			
Total PCBs	**5**	mg/kg	0.196	0.65	1.55			

J - Estimated; U - Not Detected

Table 11

Waste Disposal Evaluation Criteria

Materials	Sampling Required	PCB Evaluation Criteria	Disposition
Items for direct TSCA landfill disposal (e.g., dust, other PCB remediation waste, cleanup waste)	None required (except profiling per landfill requirements)	Not applicable (assumed to be ≥ 50 mg/kg)	TSCA-approved landfill
Equipment-unpainted metal	Wipes; one 2-point composite sample per batch of up to 50 tons or batch of <10 items, random locations	< 10 microgram per 100 square centimeter ($\mu g/100\ cm^2$)	State-permitted and licensed municipal solid waste landfill
		≥ 10 $\mu g/100\ cm^2$	TSCA-approved landfill
Equipment-painted metal	Paint samples, one 5-point composite per batch of up to 250 tons or batch of <10 items, random locations	< 1 mg/kg	Disposal as scrap
		≥ 1 mg/kg and < 50 mg/kg	State-permitted and licensed municipal solid waste landfill
		≥ 50 mg/kg	TSCA-approved landfill
Non-PCB hazardous materials/waste	Waste profiling	Per RCRA requirements	RCRA-permitted landfill or treatment, storage and/or disposal facility
Cleanup waste, decontamination fluid, water	Solid waste; wastewater		Solid waste at a state-permitted and licensed municipal solid waste landfill, RCRA-permitted landfill, or TSCA-approved landfill; decontamination fluids by TSCA-approved incineration; water treated and/or discharged in accordance with treatment facility permit.

APPENDIX A
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 9 APPROVAL DOCUMENTATION

APPENDIX B
WORK SEQUENCE AND APPROACH

WORK SEQUENCE AND APPROACH

PHASE 2 TSCA REMEDIATION
RIVERBANK ARMY AMMUNITION PLANT

Riverbank, California

February 2015

Prepared for

Riverbank Local Redevelopment Authority
Riverbank, California

Prepared by

Weston Solutions, Inc.
1340 Treat Blvd, Suite 210
Walnut Creek, California 94597-7580

TABLE OF CONTENTS

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

µg/100cm^2	microgram per 100 square centimeters
µg/m^3	microgram per cubic meters
ACM	asbestos containing material
Army	U.S. Department of the Army
EPA	U.S. Environmental Protection Agency
f/cc	fibers per cubic centimeter
mg/kg	milligrams per kilogram
NESHAP	National Emission Standards for Hazardous Air Pollutants
PCB	polychlorinated biphenyl
RACM	regulated asbestos containing material
RBAAP	Riverbank Army Ammunition Plant
RLRA	Riverbank Local Redevelopment Authority
SAP	Sampling and Analysis Plan
T&D	transportation and disposal
TSCA	Toxic Substances Control Act
UCL	upper confidence limit

1. PURPOSE

The purpose of this Work Sequence and Approach is to describe activities planned for the remediation of interior building surfaces and removal of Galbestos panels associated with several buildings at the former Riverbank Army Ammunition Plant (RBAAP) in Riverbank, California (Figure 1).

Galbestos panels were used for siding and roofing in the construction of several buildings at the former RBAAP. The majority of these buildings and associated courtyards are located within the Production Area of the former RBAAP (Figure 2). Galbestos is also known as Robertson Protected Metal manufactured by H. H. Robertson Co. It consists of a galvanized steel metal product coated under heat and pressure by a thick envelope of specially refined asphalt, now known to have contained polychlorinated biphenyls (PCBs), and bonded under pressure with a coat of heavy asbestos felt along with an application of a waterproof sealing coat. The Galbestos panels at the former RBAAP are suspected to be the primary source of non-liquid PCB contamination found in dust, paint surfaces, and concrete floors within the buildings.

A Toxic Substances Control Act (TSCA) risk-based cleanup was performed in 2013 and 2014 (Phase 1) to remove and dispose of PCB-contaminated personal property and certain fixed equipment. This Work Sequence and Approach addresses a second phase TSCA risk-based cleanup (Phase 2) to perform additional PCB remediation of real property within the Galbestos-clad buildings and associated courtyards consisting of:

- Removing dust and debris, and fixtures or equipment if present, from low-occupancy pits and trenches, followed by bulk sampling and cleaning of the concrete surfaces as required prior to backfilling and/or installing a cover consistent with the continued use provision of 40 CFR §761.30(p).
- Cleaning interior building surfaces (walls, columns, and the steel superstructure) in the low-occupancy zone defined as above 8 feet, followed by wipe sampling.
- Removing paint from concrete walls, columns and the steel superstructure in the high-occupancy zone defined as below 8 feet, followed by wipe sampling.
- Remediating concrete floors in areas with total PCB concentrations exceeding the cleanup level.
- Remediating or encapsulating of PCB-impacted fixed equipment to remain at RBAAP, or off-site disposal of equipment to be discarded.

- Removing and disposing of Galbestos panels and other remediation wastes.

Characterization sampling for disposal of building remediation wastes will be conducted as required by the receiving facility and in accordance with TSCA and the Phase 2 Sampling and Analysis Plan (SAP).

1.1 BACKGROUND

The RBAAP was originally constructed as an aluminum reduction plant and operated from 1943 to 1944. In the early 1950s the plant was modified to produce steel munitions casings. The RBAAP was designated as a Base Realignment and Closure facility in 2005 and completed its mission in May of 2009. The Riverbank Local Redevelopment Authority (RLRA) assumed maintenance and operations for the facility under a lease on April 1, 2010. The Economic Development Conveyance of the Parcel A (Main Plant) and Northwest Storm Water Reservoir Parcel, portions of which were impacted by PCB contamination, from the U.S. Department of the Army (Army) to the RLRA, is anticipated to take place under a Finding of Suitability for Early Transfer (FOSET) upon approval of a covenant deferral as defined under the Comprehensive Environmental Response, Compensation, and Liability Act.

The U.S. Environmental Protection Agency (EPA) previously approved an Army application for a risk-based PCB cleanup to remediate and remove personal property and certain fixed equipment contaminated with PCBs (Phase 1 of the TSCA remediation effort). The risk-based cleanup and disposal of equipment was conducted in accordance with the EPA Region 9 approval letter and amendments dated September 4, 2012; October 29, 2012; December 13, 2012; and July 16, 2013. Field work for Phase 1 began in September 2013 and will continue through March 2015 consistent with EPA requirements, TSCA, and the Phase 1 SAP.

This Phase 2 TSCA cleanup work will be conducted in accordance with the EPA Region 9 approval letter (when received), TSCA, and the Phase 2 SAP.

1.2 REMEDIATION APPROACH SUMMARY

The objective of the Phase 2 TSCA cleanup is to remove and dispose of Galbestos panels and remediate interior building surfaces to allow continued industrial use of the property. A variety of tenants currently occupy these buildings and, to the extent feasible, work will be sequenced and/or otherwise controlled to allow continued occupation by tenants during remediation activities. However, in some cases tenants may be relocated to work in other areas until such time as remediation is completed.

<u>Step #1—Pits and Trenches:</u> Several Galbestos buildings contain open pits and trenches that are associated with equipment that has been removed and are no longer required to remain open, or in some cases are needed to provide for infrequent access to utilities for maintenance of remaining equipment. These pits and trenches are considered low-occupancy areas. The first task to address the pits and trenches will be to remove dust and debris, and fixtures or equipment if present. The concrete surfaces will be sampled, cleaned if required, and backfilled and/or covered with a solid barrier. Backfilling or covering these trenches and pits will allow safe movement within the buildings for work crews during subsequent remediation activities, and will also improve safety of the buildings for tenant use after remediation is complete.

<u>Step #2—Remediation of Interior Surfaces and Structural Elements:</u> Next, the interior surfaces of each Galbestos-clad building will be remediated from top down, cleaning the faces of structural elements (steel beams, concrete and brick) that are accessible while the siding and roof panels remain in place. Leaving the roofing and siding in place during this portion of the work will minimize the potential spread of contamination and safety hazards associated with exposure to wind and rain. In low-occupancy areas (defined as above 8 feet), the structural elements will be vacuumed, hand wiped, or power washed to remove dust and wipe sampled. In high-occupancy areas (8 feet and below), paint will be removed and the underlying surface will be wipe sampled.

The concrete floor of the buildings will then be remediated as necessary based on previous bulk sample results. Floor areas with PCB concentrations below the cleanup criteria will be vacuumed or covered during overhead work to avoid re-contamination. Great care will be taken during remediation of the interior to avoid disturbance of the Galbestos panels. Friable asbestos is not present in the buildings. Any non-friable asbestos containing materials (ACM) not associated with the Galbestos panels within the buildings will be cleaned using a low-pressure water spray and/or hand wiping to avoid damage to the ACM.

Step #3—Removal and Disposal of Galbestos Panels: After the interior structural elements and concrete floor are cleaned and sampled, the siding and Galbestos roof panels will be removed in a careful and controlled fashion, stacked, banded, and wrapped in plastic for staging, transportation, and offsite disposal. Following panel removal, structural elements that had been inaccessible with the panels in place (e.g., surfaces of steel beams facing the Galbestos panels), will be cleaned above 8 feet, while paint below 8 feet (high-occupancy areas), will be completely removed. These surfaces will then be wipe sampled. Previously cleaned surfaces will be retested by wipe sampling to confirm that contamination did not occur during panel removal. The sequence of Galbestos panel removal may depend on a variety of factors including weather, tenant operations, and safety considerations.

Step #4—Equipment to Remain: Fixed equipment (e.g., presses) or non-fixed equipment to remain in industrial use within the Galbestos-clad buildings will be remediated and sampled consistent with the Phase 2 SAP for building surfaces, or encapsulated if necessary, consistent with 40 CFR § 761.30(p). PCB-impacted equipment removed for disposal will be sampled for waste characterization purposes prior to disposal in accordance with the Phase 2 SAP.

Step #5—Long-Term Monitoring: Once remediation is complete, long term monitoring will be implemented by the RLRA for the remaining paint on surfaces above 8 feet, encapsulated fixed equipment, and covers for pits (if samples of the cleaned concrete floor of the pit or trench exceed 25 mg/kg). Deed restrictions will accompany future transfer of property and will address remaining PCB contamination.

2. PROJECT FIELD TASKS

Field work associated with Phase 2 is anticipated to be completed within 24 months from the start date. The preliminary Phase 2 project schedule is shown on Figure 3.

2.1 MOBILIZATION AND SITE SETUP

Equipment and personnel required for the Phase 2 effort will be transported to the former RBAAP as part of mobilization and site setup. The equipment needed includes manlifts and forklifts, along with specialty equipment/tools for cleaning and/or removal of paint from interior surfaces. An administration area will be set up south of Building 6 utilizing temporary office trailers. Site-specific health and safety personnel training will be conducted.

Exclusion safety zones will be established within portions of the buildings when remediation activities are occurring. Only authorized and trained personnel will work within the exclusion zones. The boundaries of exclusion zones will be adjusted as the project progresses.

Staging areas will be established south of Building 6 to secure waste prior to transportation for off-site disposal. It is anticipated that waste will be staged for no longer than 45 days in these locations. Wastewater storage and/or treatment equipment will be brought on site and set up south of Building 6 to handle water generated during cleaning operations.

Trucks will access the site through the main entrance gate using a designated truck route (Figure 2).

2.2 PITS AND TRENCHES

Following mobilization and site setup, dust and debris will be removed from pits and trenches, and fixtures or equipment if present. The pits and trenches will be sampled, cleaned if required, backfilled and/or covered. This will be performed sequentially, building by building, and is anticipated to occur in the following order: B8, B1/45 (including courtyard), B4, B6/50, and B15. The sequence may be revised as needed to accommodate tenants or facilitate operations. Equipment such as augers, where present, and visible sediments will be removed, followed by bulk sampling of the concrete floor at a frequency of one sample from the bottom of each pit and one sample every 40 linear feet of the trench. Results will be compared with the low-occupancy PCB cleanup standard of 25 milligrams per kilogram (mg/kg) (ref. 40 CFR § 761.61(a)(4)(i)(B)). If the concentration exceeds 25 ppm, the pits and trenches will be addressed under the continued use provisions of the regulations (40 CFR § 761.30(p)), utilizing a double-wash-rinse with detergent and/or terpene hydrocarbons consistent with 40 CFR Part 761, Subpart S, and either installing a cover/lid, or backfilling with a 6-inch concrete surface on top. Covers that are installed in accordance with 40 CFR § 761.30(p) will be identified with the required M_L label.

2.3 BUILDING REMEDIATION

Once the pits/trenches have been addressed, PCB remediation will be performed sequentially, building by building, in the following order: B8, B7, B1, B2, B3, B4, B5, B6, and other Galbestos buildings. The sequence may be revised as needed to accommodate tenants or facilitate operations. Building remediation will consist of the following steps:

Site Preparation—Dust from concrete floors will be removed using vacuum cleaners equipped with high-efficiency particulate air filters. Bagged dust will be staged for disposal at an approved landfill based on characterization sampling (or may be disposed without characterization as TSCA waste, i.e., assumed to exceed 50 mg/kg).

Interior Building Surfaces Above 8 feet —Interior surfaces above 8 feet that are accessible with the Galbestos panels in place will be cleaned by vacuuming, pressure washing, and/or hand wiping. Wastewater generated for treatment/disposal and solid waste in bags will be collected for characterization and disposal. Confirmation wipe sample (using methanol rather than hexane to minimize safety concerns) will be collected from the cleaned surfaces (one sample per 40 feet of building length). The mean PCB concentration will be compared to the PCB cleanup standard of 25 microgram per 100 square centimeters (µg/100 cm^2). If necessary, recleaning will be performed on all surfaces within 20 feet of either side of the original sample location, and a wipe sample will be collected at a random location within the recleaned area. Recleaning and resampling will continue until the mean of the updated dataset is below the cleanup level.

Interior Building Surfaces Below 8 feet—Paint will be removed from metal members or concrete below 8 feet using high-pressure water, high-pressure water with abrasive media, or mechanical means (e.g., needle guns). Confirmation wipe samples will be collected of the visually bare surface at a frequency of one sample per 40 feet of building length. The mean PCB concentration will be compared to the high-occupancy cleanup level of 10 µg/100 cm^2. Recleaning and resampling will continue, if necessary, until the mean is below the cleanup level.

Decontamination water and paint residue will be collected by vacuuming and stored for analysis and disposal.

Concrete Floors—Concrete floors will be remediated based on the characterization sample results presented in the SAP and to the risk-based cleanup levels developed in the SAP as follows: mean PCB concentration $\leq$ 5 mg/kg with the maximum concentration < 25 mg/kg. A deed restriction will be required limiting the property to industrial use only. Six areas with PCB concentrations exceeding 25 mg/kg will be remediated using scabbling or equivalent methods, or by complete removal and replacement of the concrete slab. Confirmation bulk samples will be collected after scabbling, the results incorporated into the dataset, and the mean recalculated.

Remediation of Equipment for Reuse—Painted fixed equipment that is to remain (e.g. presses), will be cleaned using the double-wash-rinse procedure described in 40 CFR Part 761, Subpart S (using a terpene-hydrocarbon based solvent/degreaser), encapsulated and labeled per 40 CFR § 761.30(p). Alternatively, paint may be removed by methods similar to the building surfaces below 8 feet, with three wipe samples collected from each item and results compared to the PCB high-occupancy level of 10 µg/100 cm^2.

Galbestos Panel Removal—The sequence of panel removal from the siding and roof within each building may vary depending on weather, tenant, or access considerations. Panels will be accessed using scissor lifts, manlifts, or bucket trucks. Work will be performed from the inside of buildings or courtyards when panels are not accessible from the outside. Electrical outages will be coordinated to allow safe working conditions in proximity to high-voltage electrical lines and equipment.

Each panel contains 12 bolts that attach the panels to the building. Panels will be removed using pneumatic chisels to shear the bolt heads on the exterior of the panels, taking care not to damage the panels themselves. The bolts at the top of the panel will be removed first, and the top of the panel will then be pulled away from the building and a clamp fastened to the panel. A cable will be attached to the clamp and the remaining bolt heads on the panel will be sheared and the panel will be lowered by either a long reach forklift or a pulley system. Ground crew personnel will detach the panel from the clamp, place panels on plastic sheeting to a stack height of up to six feet, burrito wrap with the plastic sheeting and band each stack. The plastic wrapped stacks will then be staged for transportation and disposal (T&D) to a TSCA-approved landfill without sampling (expected to exceed 500 mg/kg). This process will be repeated until the removal is complete.

After panel removal, previously inaccessible interior surfaces will be remediated (cleaned above 8 feet; paint removed below 8 feet). Due to the smaller surface area involved, one wipe sample per 120 feet of building length will be collected from previously inaccessible areas, results incorporated into the respective dataset, and the mean PCB concentration recalculated. Recleaning and resampling will continue, as necessary, until the mean concentration of the areas above 8 feet is below the cleanup level of 25 µg/100 cm^2 and the mean concentration for the areas below 8 feet is below the cleanup level of 10 µg/100 cm^2. Previously cleaned structural elements will be sampled with wipes after panel removal at a frequency of every 120 feet of building length to confirm that re-contamination has not occurred. Collected paint and any media used will be profiled for disposal at an appropriate landfill based on PCB and lead concentrations.

2.4 TRANSPORTATION AND DISPOSAL

Waste will be generated throughout Phase 2 and will be staged south of Building 6 until loaded for transportation and disposal at an appropriate landfill. The following waste streams and estimated quantities are anticipated:

Approximately 34 truckloads (480 tons) of solid waste from paint chips, abrasives, bag filters and/or sand from sand filters is expected to require disposal at a TSCA permitted landfill; to be transported in end dumps or rolloff bins.

Approximately 40 truckloads (800 tons) of concrete waste from remediation of the floors is expected to require disposal at a TSCA landfill (>50 mg/kg PCBs – sample results to confirm this assumption) to be transported in end dumps.

Approximately 22 truckloads (highsides and rolloff bins; expected to be less than 10 tons per load) of bagged dust, plastic and miscellaneous remediation waste is expected to require disposal at a non-TSCA or TSCA landfill depending on waste characterization.

Approximately 132 truckload loads (approximately 1,400 tons) of bundled and wrapped Galbestos and PCB-contaminated panels (estimated weight of 11 tons per load) are expected to require disposal at a TSCA landfill; previous sampling of Galbestos indicates non-RCRA hazardous for lead.

Fixed equipment (scrubbers, tanks, etc.) may be removed for disposal. The quantity of this equipment is approximately 300 tons. The work will be performed consistent with the protocol used during the Phase 1 work and sampled in accordance with Table 2 of the Phase 2 SAP.

It is estimated that up to 500,000 gallons of water will be generated from cleaning of interior surfaces and/or paint removal. Water will be sampled and discharged to the Riverbank Wastewater Treatment Plant or an approved off-site disposal facility depending on results.

Although end dumps are the preferred method of transport to the landfills due to lower cost, a limited use of rolloff bins may also be utilized to transport wastes if appropriate. Waste disposal will occur throughout the project and it is anticipated that waste streams will not be stored for longer than 45 days, other than wastewater, which may be held in double-contained storage until a sufficient quantity has accumulated for pretreatment and/or disposal.

The following steps will be followed to facilitate transportation and disposal:

- Collect samples as required by the receiving facility, or use generator knowledge, to profile each waste stream.
- The T&D subcontractor will assist with preparation of a profile based the sample results and waste characterization and provide it to the RLRA.
- The RLRA will provide the profile to the Army for review and signature.
- Once the profile is signed by the Army, the RLRA will provide it to the T&D subcontractor. The T&D subcontractor will then submit the signed profile, and summary of sampling results and laboratory report if applicable, to the receiving facility for approval.
- The receiving facility will approve the profile, assign an approval number, and provide all the nomenclature and waste codes that are applicable.
- Based on receiving facility approval, the T&D subcontractor will prepare a template manifest based on the waste profile which will be checked by RLRA. This will be

provided to the Army (before transporting off-site) for approval. The Army will add any additional information as appropriate (e.g. tracking numbers, etc.).

- Once the Army approves the template, manifests will be printed and provided to the Army representative for signature at the time of loading.
- The receiving facility will provide as-received weights and a signed copy of the manifest.

2.5 AIR MONITORING AND WORKER/TENANT SAFETY

An Accident Prevention Plan/Site Safety and Health Plan will be prepared prior to field work to describe potential hazards associated with the work and administrative and engineering controls to minimize those hazards to workers and tenants. Contaminants that pose a potential safety concern during Phase 2 operations include PCBs (contained in the Galbestos panels, in contaminated paint and other porous surfaces, and in contaminated dust); asbestos (contained in Galbestos panels); metals associated with lead-based paint; and other activity-specific contaminants such as silica dust generated during concrete scabbling/grinding, solvents used for cleaning or wipe sampling, and potential hazardous atmosphere that may be encountered during work in pits. Physical hazards include those associated with work in proximity to high-voltage electrical lines and equipment, work on elevated platforms, use of power tools, and use of mechanized and material handling equipment. Exclusion zones will be used to prohibit access of unauthorized personnel in areas where work-related hazards may be present. Air monitoring will be performed to identify and monitor for air-borne hazards. Air monitoring within the exclusion zones is used to confirm worker safety. Air monitoring outside exclusion zones is used to confirm the safety of tenants or other personnel in the vicinity of the work.

PCBs and asbestos are present within the coating of Galbestos panels, and were added as part of the manufacturing process. Based on definitions in the National Emission Standards for Hazardous Air Pollutants (NESHAP), Galbestos is considered a Category I non-friable ACM; weathered Galbestos is sometimes classified as a Category II non-friable ACM. In either case, they are not considered regulated asbestos containing material (RACM) under NESHAP unless subjected to sanding, grinding, cutting or abrading, or otherwise become friable. It is anticipated that remediation associated with Phase 2 operations will not render the Galbestos friable and therefore the project will not be regulated under NESHAP; however, notification of the remediation will be provided to EPA Region IX and to the San Joaquin Valley Unified Air Pollution Control District.

Galbestos is ACM; therefore work associated with removal of Galbestos panels is regulated under the California Code of Regulations, Title 8, Section 1529 as Class II asbestos work. During removal of ACM (Galbestos) or potential ACM, an asbestos certified supervisor/competent person will be onsite to monitor and inspect the work. A negative exposure assessment using initial exposure monitoring from worker breathing zone air samples will be performed upon start of the work to demonstrate that employee exposure is expected to be consistently below the permissible exposure limits for asbestos fibers in air.

Engineering controls, such as controlled removal, lowering and immediate plastic wrapping of intact Galbestos panels, vacuuming of dust with HEPA filters, and use of wet decontamination methods where feasible will be used to minimize the spread of contamination. Protective personnel equipment, such as half-face respirators and Tyvek, will be used as required or appropriate, for worker safety.

2.5.1 Exclusion Zones

Exclusions zones will be established to minimize the potential for tenants to access work areas and to prevent the uncontrolled spread of contamination. A defined exclusion zone will be established at access perimeters for work areas where air-borne contaminants or physical hazards may be present due to work activities. The perimeter of the exclusion zone will be defined by barricade tape or plastic sheeting to restrict access. Only qualified personnel will be allowed to enter the exclusion zone.

2.5.2 Air Monitoring Inside the Exclusion Zone

An air monitoring station within the exclusion zone will be used to collect samples during working hours. Samples will be collected with a low-flow pump per National Institute for Occupational Safety and Health Method 5503. The stationary air monitoring stations will be relocated as the work progresses through the buildings.

Asbestos fibers per cubic centimeter (f/cc) will be monitored in air within the exclusion zone to confirm safe working conditions during the Phase 2 work, daily during Galbestos panel removal, and weekly during other work. Air samples will be analyzed using NIOSH 7400 method and compared to an action limit of 0.025 f/cc (the asbestos 8-hour time weighted average permissible exposure limit is 0.1 f/cc). Phase 1 exclusion zone asbestos sample results were generally non-detects, with a maximum result of 0.005 f/cc.

PCBs will be monitored within the exclusion zone using a low-flow pump (per EPA Method TO-10A) on a weekly basis. Air sample results will be compared to an action limit of 0.5 micrograms per cubic meters (µg/m^3). The NIOSH time weighted average recommended exposure limit is 1.0 µg/m^3. Phase 1 exclusion-zone PCB sample results were all below the detection limit.

Dust levels (PM_{10}) will be monitored on a daily basis within in the exclusion zone, with an action level of 0.5 mg/m^3. Additional air monitoring is anticipated during specific Phase 2 activities, e.g., 5-gas atmospheric monitoring during work within pits, in order to ensure worker safety. These will be described in more detail in the Accident Prevention Plan/Site Safety and Health Plan.

2.5.3 Air Monitoring Outside the Exclusion Zone

An air monitoring station utilizing a high-flow pump to collect PCB samples (per EPA Method TO-4A) will be located outside the exclusion zone adjacent to the nearest tenant occupied area during interior cleaning activities. Samples will be collected daily when Galbestos panel removal is being performed, and weekly during other work. The detection limit for TO-4A analysis will be $\leq$ 0.02 µg/m^3. The action level for TO-4A samples is 0.2 µg/m^3 total PCBs. Work practices will be modified if the high-flow air monitoring results exceed the action level and the Army will notify EPA. Phase 1 high-flow air sample results outside the exclusion zone, including tenant-occupied buildings, ranged from 0.009 µg/m^3 to 0.132 µg/m^3 total PCBs, with an average of approximately 0.05 µg/m^3 total PCBs.

After Phase 2 activities have been completed in each building, a final TO-4A sample will be collected to document the post-remediation airborne PCB concentration.

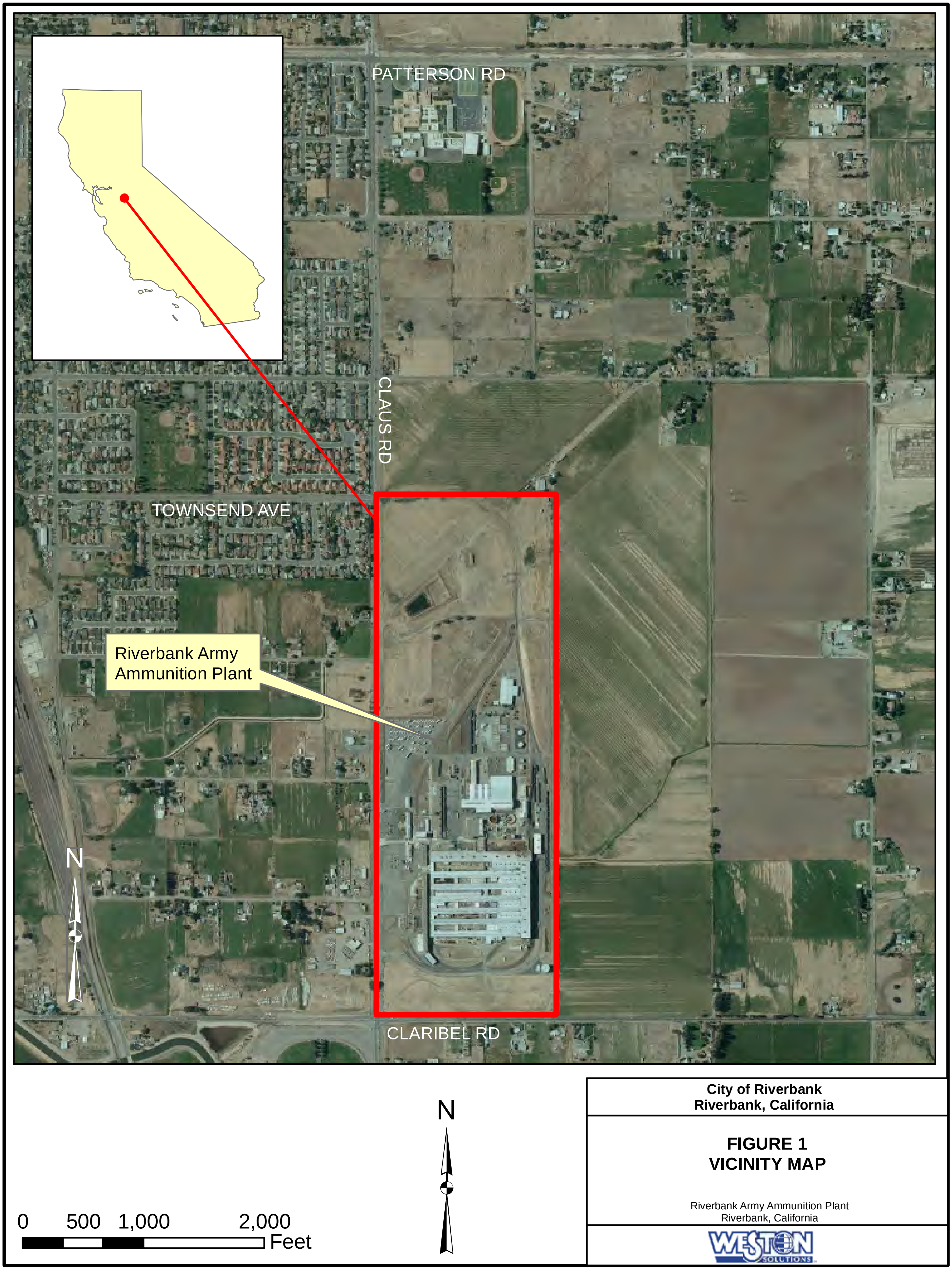
2.6 DEMOBILIZATION

Treated water remaining in the wastewater pretreatment system will be sampled and discharged to the Riverbank Wastewater Treatment Plant or an approved off-site disposal facility. Treatment media (if used) will be disposed at a TSCA-approved landfill and the vessels will be wipe-tested to confirm that no residual PCB contamination remains (e.g., results greater than 10 µg/100cm^2). Temporary office trailers and equipment will be removed from the site.

2.7 FINAL REPORT

A final Certification Report detailing the work completed during Phase 2, along with analytical results, waste disposal manifests, and disposed quantities, will be prepared at completion of the field activities. The report will include appropriate records of sampling activities and analytical results to demonstrate that objectives of the risk-based cleanup and conditions of the associated EPA approval have been met.

FIGURES

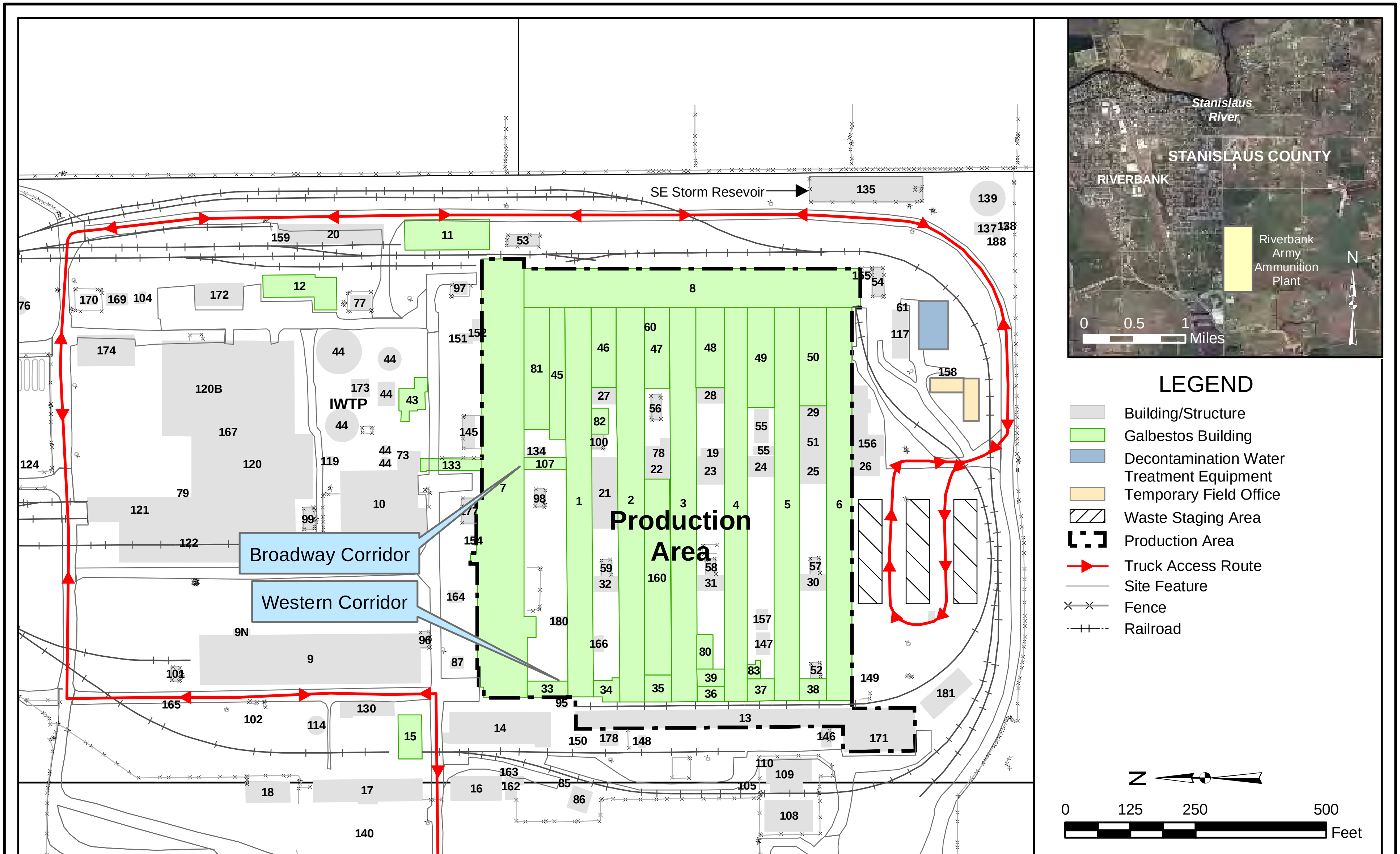


City of Riverbank
Riverbank, California

FIGURE 1
VICINITY MAP

Riverbank Army Ammunition Plant
Riverbank, California

WESTON SOLUTIONS



City of Riverbank
Riverbank, California

FIGURE 2
RBAAP PHASE 2
SITE LAYOUT

Riverbank Army Ammunition Plant
Riverbank, California

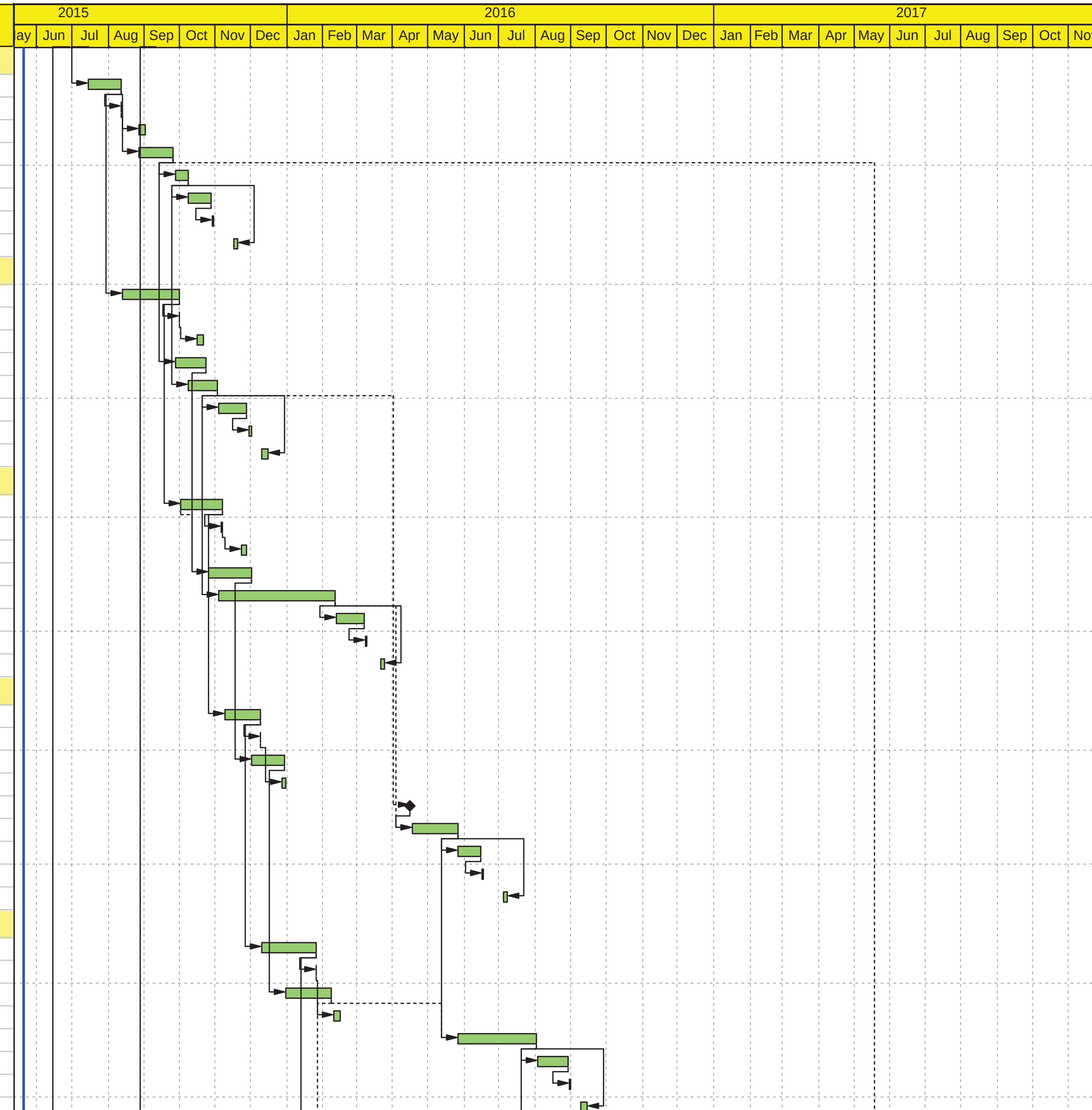
Activity ID	Activity Name	Original Duration	Start	Finish
Pre-Fieldwork		642d	21-May-15	20-Nov-17
A1000	Notice to Proceed	1d	21-May-15	21-May-15
A1010	Pre-mobilization submittals - 1Q 2015	30d	22-May-15	20-Jun-15
A1020	Mobilization	5d	22-Jun-15	26-Jun-15
A1025	Project Support	915d	21-May-15	20-Nov-17
Air Monitoring		774d	29-Jun-15	10-Aug-17
A1460	Air Monitoring	774d	29-Jun-15	10-Aug-17
Pits & Trenches		59d	29-Jun-15	18-Sep-15
B8		34d	29-Jun-15	13-Aug-15
A1030	B8 - Clean pits & trenches	21d	29-Jun-15	27-Jul-15
A1040	B8 - Sample	21d	30-Jun-15	28-Jul-15
A1050	B8 - Remove concrete cap interferences	21d	01-Jul-15	29-Jul-15
A1060	B8 - Fill pits/trenches	22d	14-Jul-15	12-Aug-15
A1070	B8 - Cover pits/trenches	22d	15-Jul-15	13-Aug-15
B1/45		27d	28-Jul-15	02-Sep-15
A1080	B1/45 - Clean pits & trenches	3d	28-Jul-15	30-Jul-15
A1090	B1/45 - Sample	3d	29-Jul-15	31-Jul-15
A1100	B1/45 - Remove concrete cap interferences	3d	30-Jul-15	03-Aug-15
A1110	B1/45 - Fill pits/trenches	3d	13-Aug-15	17-Aug-15
A1120	B1/45 - Cover pits/trenches	14d	14-Aug-15	02-Sep-15
B4		14d	31-Jul-15	19-Aug-15
A1130	B4 - Clean pits & trenches	1d	31-Jul-15	31-Jul-15
A1140	B4 - Sample	1d	03-Aug-15	03-Aug-15
A1150	B4 - Remove concrete cap interferences	1d	04-Aug-15	04-Aug-15
A1160	B4 - Fill pits/trenches	1d	18-Aug-15	18-Aug-15
A1170	B4 - Cover pits/trenches	1d	19-Aug-15	19-Aug-15
B6/50		34d	03-Aug-15	18-Sep-15
A1180	B6/50 - Clean pits & trenches	5d	03-Aug-15	07-Aug-15
A1190	B6/50 - Sample	5d	04-Aug-15	10-Aug-15
A1200	B6/50 - Remove concrete cap interferences	5d	05-Aug-15	11-Aug-15
A1210	B6/50 - Fill pits/trenches	5d	19-Aug-15	25-Aug-15
A1220	B6/50 - Cover pits/trenches	21d	20-Aug-15	18-Sep-15
Other Galbestos Buildings (15, 80)		15d	10-Aug-15	28-Aug-15
A1230	Other Bldgs - Clean pits & trenches	1d	10-Aug-15	10-Aug-15
A1240	Other Bldgs - Sample	1d	11-Aug-15	11-Aug-15
A1250	Other Bldgs - Remove concrete cap interferences	1d	12-Aug-15	12-Aug-15
A1260	Other Bldgs - Fill pits/trenches	1d	26-Aug-15	26-Aug-15
A1270	Other Bldgs - Cover pits/trenches	2d	27-Aug-15	28-Aug-15
Non-Galbestos Buildings (9, 13, 14, 120, 156, 171, 181)		22d	11-Aug-15	10-Sep-15
A2340	Non-Galbestos Bldgs - Clean pits & trenches	4d	11-Aug-15	14-Aug-15
A2350	Non-Galbestos Bldgs - Sample	4d	12-Aug-15	17-Aug-15
A2360	Non-Galbestos Bldgs - Remove concrete cap interferences	4d	13-Aug-15	18-Aug-15
A2370	Non-Galbestos Bldgs - Fill pits/trenches	4d	27-Aug-15	01-Sep-15
A2380	Non-Galbestos Bldgs - Cover pits/trenches	9d	28-Aug-15	10-Sep-15
Structure, Floors & Panels		547d 4h	15-Jul-15	31-Aug-17

Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

FIGURE 3
RBAAP PHASE 2 PRELIMINARY SCHEDULE

03-Feb-15

Activity ID	Activity Name	Original Duration	Start	Finish
B8		91d	15-Jul-15	19-Nov-15
A1300	B8 - Clean accessible interior surfaces above 8 ft	21d	15-Jul-15	12-Aug-15
A1310	B8 - Sample accessible painted interior	1d	12-Aug-15	12-Aug-15
A1315	B8 - Re-clean accessible painted interior, if necessary	4d	27-Aug-15	01-Sep-15
A1320	B8 - Remove paint below 8 ft & sample	21d	27-Aug-15	25-Sep-15
A1360	B8 - Remove panels	9d	28-Sep-15	08-Oct-15
A1370	B8 - Remediate inaccessible interior surfaces below & above ...	14d	09-Oct-15	28-Oct-15
A1380	B8 - Sample inaccessible & previously cleaned surfaces	2d	29-Oct-15	30-Oct-15
A1390	B8 - T&D	4d	16-Nov-15	19-Nov-15
B7 (7, 133)		87d	13-Aug-15	15-Dec-15
A1410	B7 - Clean accessible interior surfaces above 8 ft	35d	13-Aug-15	01-Oct-15
A1420	B7 - Sample accessible painted interior	1d	01-Oct-15	01-Oct-15
A1425	B7 - Re-clean accessible painted interior, if necessary	4d	16-Oct-15	21-Oct-15
A1430	B7 - Remove paint below 8 ft & sample	20d	28-Sep-15	23-Oct-15
A1470	B7 - Remove panels	17d	09-Oct-15	02-Nov-15
A1480	B7 - Remediate inaccessible interior surfaces below & above ...	18d	03-Nov-15	27-Nov-15
A1490	B7 - Sample inaccessible & previously cleaned surfaces	2d	30-Nov-15	01-Dec-15
A1510	B7 - T&D	4d	10-Dec-15	15-Dec-15
B1 (1, 45, 81, 82)		121d	02-Oct-15	24-Mar-16
A1520	B1 - Clean accessible interior surfaces above 8 ft	26d	02-Oct-15	06-Nov-15
A1530	B1 - Sample accessible painted interior	1d	06-Nov-15	06-Nov-15
A1535	B1 - Re-clean accessible painted interior, if necessary	4d	23-Nov-15	27-Nov-15
A1540	B1 - Remove paint below 8 ft & sample	26d	26-Oct-15	01-Dec-15
A1580	B1 - Remove panels	69d	03-Nov-15	11-Feb-16
A1590	B1 - Remediate inaccessible interior surfaces below & above ...	17d	12-Feb-16	07-Mar-16
A1600	B1 - Sample inaccessible & previously cleaned surfaces	2d	08-Mar-16	09-Mar-16
A1610	B1 - T&D	4d	21-Mar-16	24-Mar-16
B2 (2, 46)		170d	09-Nov-15	08-Jul-16
A1630	B2 - Clean accessible interior surfaces above 8 ft	22d	09-Nov-15	09-Dec-15
A1640	B2 - Sample accessible painted interior	1d	09-Dec-15	09-Dec-15
A1650	B2 - Remove paint below 8 ft & sample	19d	02-Dec-15	30-Dec-15
A1645	B2 - Re-clean accessible painted interior, if necessary	4d	28-Dec-15	31-Dec-15
A1500	Weather stand down	0d		15-Apr-16*
A1690	B2 - Remove panels	29d	18-Apr-16	26-May-16
A1700	B2 - Remediate inaccessible interior surfaces below & above ...	14d	27-May-16	15-Jun-16
A1710	B2 - Sample inaccessible & previously cleaned surfaces	2d	16-Jun-16	17-Jun-16
A1720	B2 - T&D	4d	05-Jul-16	08-Jul-16
B3 (3, 47)		195d	10-Dec-15	14-Sep-16
A1740	B3 - Clean accessible interior surfaces above 8 ft	31d	10-Dec-15	26-Jan-16
A1750	B3 - Sample accessible painted interior	1d	26-Jan-16	26-Jan-16
A1760	B3 - Remove paint below 8 ft & sample	27d	31-Dec-15	08-Feb-16
A1755	B3 - Re-clean accessible painted interior, if necessary	4d	10-Feb-16	15-Feb-16
A1800	B3 - Remove panels	47d	27-May-16	02-Aug-16
A1810	B3 - Remediate inaccessible interior surfaces below & above ...	19d	03-Aug-16	29-Aug-16
A1820	B3 - Sample inaccessible & previously cleaned surfaces	2d	30-Aug-16	31-Aug-16
A1830	B3 - T&D	4d	09-Sep-16	14-Sep-16

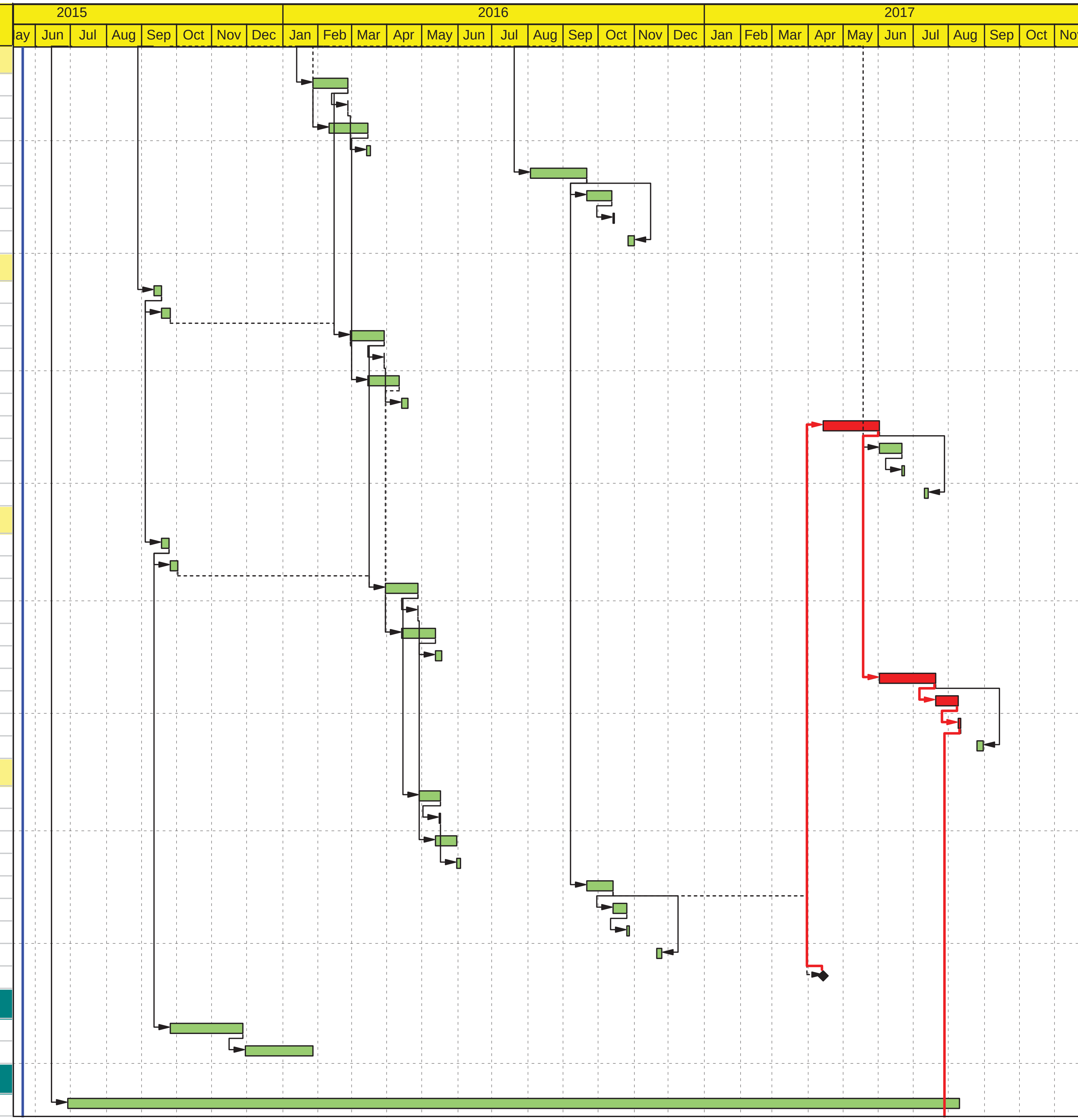


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

FIGURE 3
RBAAP PHASE 2 PRELIMINARY SCHEDULE

03-Feb-15

Activity ID	Activity Name	Original Duration	Start	Finish
B4 (4, 39, 48, 83)		198d	27-Jan-16	01-Nov-16
A1850	B4 - Clean accessible interior surfaces above 8 ft	23d	27-Jan-16	26-Feb-16
A1860	B4 - Sample accessible painted interior	1d	26-Feb-16	26-Feb-16
A1870	B4 - Remove paint below 8 ft & sample	24d	10-Feb-16	14-Mar-16
A1865	B4 - Re-clean accessible painted interior, if necessary	4d	14-Mar-16	17-Mar-16
A1910	B4 - Remove panels	34d	03-Aug-16	20-Sep-16
A1920	B4 - Remediate inaccessible interior surfaces below & above ...	16d	21-Sep-16	12-Oct-16
A1930	B4 - Sample inaccessible & previously cleaned surfaces	2d	13-Oct-16	14-Oct-16
A1940	B4 - T&D	4d	27-Oct-16	01-Nov-16
B5 (5, 49)		472d 4h	11-Sep-15	14-Jul-17
A1950	B5 - Concrete Floor Removal	5d	11-Sep-15	17-Sep-15
A1955	B5 - Concrete Floor Dowel & Replace	6d	18-Sep-15	25-Sep-15
A1960	B5 - Clean accessible interior surfaces above 8 ft	22d	29-Feb-16	29-Mar-16
A1970	B5 - Sample accessible painted interior	1d	29-Mar-16	29-Mar-16
A1980	B5 - Remove paint below 8 ft & sample	20d	15-Mar-16	11-Apr-16
A1975	B5 - Re-clean accessible painted interior, if necessary	4d	13-Apr-16	18-Apr-16
A2020	B5 - Remove panels	34d	14-Apr-17	01-Jun-17
A2030	B5 - Remediate inaccessible interior surfaces below & above ...	14d	01-Jun-17	21-Jun-17
A2040	B5 - Sample inaccessible & previously cleaned surfaces	2d	21-Jun-17	23-Jun-17
A2050	B5 - T&D	4d	10-Jul-17	14-Jul-17
B6 (6, 50)		501d 4h	18-Sep-15	31-Aug-17
A2060	B6 - Concrete Floor Removal	5d	18-Sep-15	24-Sep-15
A2065	B6 - Concrete Floor Dowel & Replace	6d	25-Sep-15	02-Oct-15
A2070	B6 - Clean accessible interior surfaces above 8 ft	21d	30-Mar-16	27-Apr-16
A2080	B6 - Sample accessible painted interior	1d	27-Apr-16	27-Apr-16
A2090	B6 - Remove paint below 8 ft & sample	22d	13-Apr-16	12-May-16
A2085	B6 - Re-clean accessible painted interior, if necessary	4d	12-May-16	17-May-16
A2130	B6 - Remove panels	34d	01-Jun-17	20-Jul-17
A2140	B6 - Remediate inaccessible interior surfaces below & above ...	14d	20-Jul-17	09-Aug-17
A2150	B6 - Sample inaccessible & previously cleaned surfaces	2d	09-Aug-17	11-Aug-17
A2160	B6 - T&D	4d	25-Aug-17	31-Aug-17
Other Galbestos Buildings (11, 12, 15, 43)		248d 4h	28-Apr-16	14-Apr-17
A2180	Other Blds. - Clean accessible interior surfaces above 8 ft	13d	28-Apr-16	16-May-16
A2190	Other Blds. - Sample accessible painted interior	1d	16-May-16	16-May-16
A2200	Other Blds. - Remove paint below 8 ft & sample	12d	13-May-16	30-May-16
A2195	Other Blds. - Re-clean accessible painted interior, if necessary	4d	31-May-16	03-Jun-16
A2240	Other Blds. - Remove panels	17d	21-Sep-16	13-Oct-16
A2250	Other Blds. - Remediate inaccessible interior surfaces below ...	8d	14-Oct-16	25-Oct-16
A2260	Other Blds. - Sample inaccessible & previously cleaned surfac...	2d	26-Oct-16	27-Oct-16
A2265	Other Blds. - T&D	4d	21-Nov-16	25-Nov-16
A2270	Weather stand down	0d		14-Apr-17*
Miscellaneous Items & Press Encapsulation		85d	25-Sep-15	27-Jan-16
A2390	Remove/Remediate Miscellaneous Items	45d	25-Sep-15	27-Nov-15
A2400	Encapsulate Presses	40d	30-Nov-15	27-Jan-16
Water Treatment		774d	29-Jun-15	10-Aug-17
A2410	Water Treatment	774d	29-Jun-15	10-Aug-17

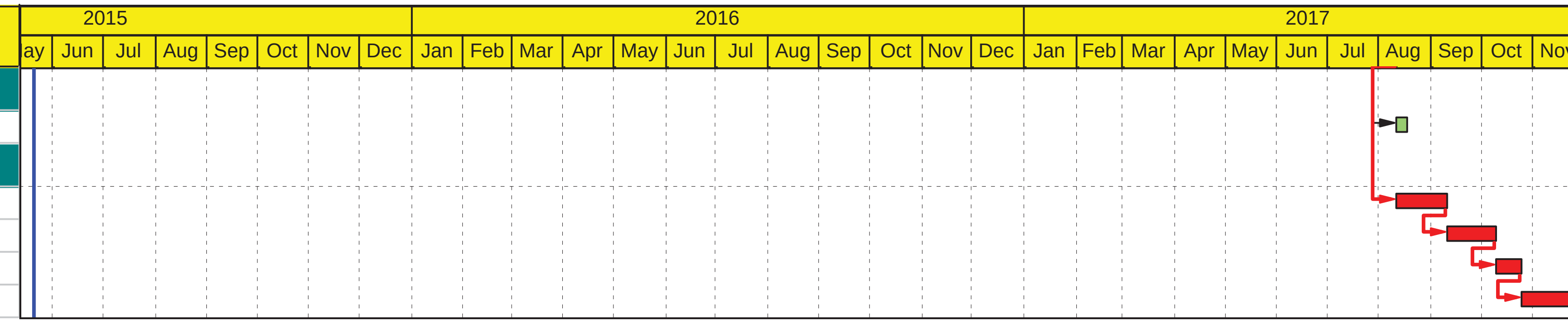


Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

FIGURE 3
RBAAP PHASE 2 PRELIMINARY SCHEDULE

03-Feb-15

Activity ID	Activity Name	Original Duration	Start	Finish
T&D/Demob		5d	11-Aug-17	18-Aug-17
A2290	Demobilization	5d	11-Aug-17	18-Aug-17
Reports		105d	11-Aug-17	24-Nov-17
A2300	Draft Report	30d	11-Aug-17	10-Sep-17
A2310	RBAAP Review Draft Report	30d	10-Sep-17	10-Oct-17
A2320	Final Report	15d	10-Oct-17	25-Oct-17
A2330	RBAAP Review Final Report	30d	25-Oct-17	24-Nov-17



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone

FIGURE 3
RBAAP PHASE 2 PRELIMINARY SCHEDULE

03-Feb-15

APPENDIX C
WIPE SAMPLING AND DOUBLE WASH/RINSE CLEANUP AS RECOMMENDED BY THE ENVIRONMENTAL PROTECTION AGENCY PCB SPILL CLEANUP POLICY

WIPE SAMPLING AND DOUBLE WASH/RINSE CLEANUP

AS RECOMMENDED BY

THE ENVIRONMENTAL PROTECTION AGENCY PCB SPILL CLEANUP POLICY

June 23, 1987

Revised and Clarified on April 18, 1991

Written By:

John H. Smith, Ph.D.
Chief, PCB Disposal Section
Chemical Regulation Branch
United States Environmental Protection Agency
Washington, D.C.

CONTENTS

I. WIPE SAMPLING ACCORDING TO THE PCB SPILL CLEANUP POLICY

Introduction:

This document was prepared following the publication of the PCB Spill Cleanup Policy in the Federal Register on April 2, 1987. The procedures were demonstrated by EPA PCB program technical staff at PCB Forum '87 and PCB Forum '88. These PCB forums were privately sponsored seminars discussing the requirements of the recently issued PCB Spill Cleanup Policy. The seminars were publicly announced and held in eight cities near the EPA Regional Offices.

The revisions and clarifications to the document include the addition of an Introduction heading, the addition of three paragraphs to the Background heading, and the amendment to item 4 in "An Example of a Wipe Sampling Procedure."

This document was revised and clarified because it did not clearly and completely state EPA's intentions in an area where details were essential, that is the original version of this document assumed that a gloved hand would apply the gauze with moderate pressure, but inadvertently this requirement was never explicitly stated in the example of the wipe sampling procedure. The gloved-hand application of the gauze might have been assumed since the gloves were to be discarded after each sample. The procedure clearly did not say to apply the gauze to the surface with forceps. The EPA demonstrations and discussions at the PCB Forums clearly emphasized the pressurized application of moistened cotton gauze to the surface with a gloved hand.

Background:

The PCB spill Cleanup Policy requires wipe sampling for the determination of surface levels of PCBs resulting from PCB spills onto hard, "smooth", surfaces such as metal, wood, concrete, plastic, and glass (see Tables 1 and 2). There are several activities surrounding a PCB spill cleanup where wipe sampling may be used: (a) site characterization; (b) interim evaluation of the progress of the cleanup; and (c) the final process to verify that the cleanup has met requirements of the PCB Spill Cleanup Policy.

Wipe sampling has a number of advantages. The most apparent advantage is that wipe sampling is probably the best way to determine smooth "impervious" surface concentrations. Wipe sampling is most effective in areas with relatively large, flat, easily accessible surfaces where an accidental and/or short time exposure to PCBs has occurred. The surfaces which are sampled by wipe sampling in many cases will have been (or will be) cleaned by wiping or wiping-related activities.

Wipe sampling is best used in conjunction with statistical random sampling and/or area sampling techniques. Reduction in sampling errors for all kinds of sampling procedures can be accomplished by statistical selection of the smaller sampling sites selected to represent a larger area. Non-sampling errors may be reduced by maintaining consistency within the sampling activities; use of comprehensive quality control procedures and samples; and wherever possible, establishing a reference point for comparison.

Unfortunately, wipe sampling is not quantitative because of the fairly large variability in several component parts of sampling and the relative inefficiency of extraction of the analyte of interest from the wipes. Wipe sampling evaluation study results are known to vary widely, for example, when the same sampling is done (1) by different samplers; (2) on similarly contaminated surfaces having different textures or porosities; (3) using no solvent or solvents having different polarities; and (4) using different kinds of wiping material such as filter paper or cotton gauze.

When a decision is made to use wipe sampling, (1) it should be assumed that the results are not always reproducible; (2) extra care should be used to minimize the variability and optimize quantitation; and (3) even if representative sampling is employed, wipe sampling results can indicate residual levels substantially below true surface levels. In developing the PCB Spill Cleanup Policy, EPA has considered the advantages and disadvantages of wipe sampling and accordingly has established allowable residual PCB levels as measured by wipe sampling.

Since the objective of surface sampling is to remove PCB liquids and particles, which may be adhering to the surface, from the surface an aggressive sampling procedure is necessary. The aggressive sampling is appropriate since often the surfaces being samples have been aggressively cleaned and may drive residual PCBs into the surface. For determining the PCB surface concentrations on smooth surfaces, EPA recommends wipe sampling using cotton gauze as the wipe medium and using a gloved or doubly gloved hand to apply the wipe to the surface. This procedure requires changing into new/clean gloves between samples. EPA recognizes that there may be some transport of PCBs from the gauze to the surface of the gloves. However, this potential loss is considered more acceptable than the problems from the disadvantages of other wipe sampling procedures.

Procedures employing filter paper and/or glass fiber pads and application of these pads to surfaces by swabbing, dipping, or brushing with a pair of forceps are unacceptable. EPA recognizes that this kind of wipe sampling technique may be widely applied to address other kinds of surface sampling objectives. However, to meet EPA's PCB surface sampling objectives, these procedures are less efficient and less effective than hand wiping with the more absorbent cotton gauze.

Any compositing of wipe samples or sampling of areas larger than 100 cm^2 may not address the intent of PCB Spill Cleanup Policy verification sampling.

Answers to Questions on Wipe Sampling Procedures:

Why is does it take so much care to wipe sample correctly?

There is a considerable variability possible among wipe sampling results due to (a) the sampling technique of the sampler and (b) the efficiencies of removing PCBs from several matrices and placing the PCBs into several other matrices. Therefore it is important to reduce this variability to the maximum extent possible, so that in the event of a verification analysis by quality control samplers or government enforcement inspectors, similar wipe sampling results will be obtained for a clean site.

Two factors increase the probability of reducing errors introduced by the sampler's technique: consistency and quality control. Consistency is aided by proper training, easily understood sampling procedures, immediate availability of proper supplies, and whenever possible, using the same sampler to do all sampling at a particular site. Quality control procedures provide reference points and comparisons for the field sample results. When the analytical results from quality control samples indicate potential sampling and analysis problems, there is often sufficient time to reexamine field results. Quality control sampling can reduce or eliminate additional sampling and analysis start up and/or additional cleanup costs.

The reproducibility and efficiency of transferring residual PCBs from one place to another require that such residual PCBs must have a much greater affinity to partition, in one or more steps, from the place of origin to the ultimate destination. For all transfer steps, PCBs must exhibit a much greater propensity to be in the destination medium than in the medium of origin. There are several transfer steps in the process which starts from the removal of PCBs from the surface sampled and ends with the production of a PCB surface concentration by way of instrumental analysis.

The first of these transfer steps is removing residual PCBs from the surface to be sampled and transferring them into the sampling medium*. Gauze pads are sturdier, allow better surface to surface contact, and absorb more solvent (and more PCBs) than filter paper. Therefore, gauze pads are the absorbent/sampling medium of choice. Since PCBs are very soluble in organic solvents, organic solvent is used to moisten the gauze pads to ease the transport of PCBs from the sampled surface into the sampling media. Once the areas of where the spill occurred have been sampled (after cleanup) and the residual PCBs have been transported to the moistened gauze, then the gauze is air dried and stored/shipped for chemical analysis. The gauze is dried so as to facilitate transfer by organic solvent from the gauze to another medium during the laboratory extraction step.

In the extraction step the PCBs must be isolated from the gauze in a form amenable to the chemical analysis methods to be used. The PCBs now in the gauze are usually extracted into a solvent by repeated rinsing with and subsequent collection of organic solvent. The extraction solvent is removed from the PCBs by evaporation of the solvent prior to chemical analysis. The more volatile organic solvent evaporates and leaves the less volatile PCBs in a more concentrated solution for further treatment or instrumental analysis.

What is the best way to wipe sample for PCBs on smooth surfaces?

There are several steps in a wipe sampling procedure. The first step is to prepare the sampler for the sampling activity. The sampler may have to be advised of (through a briefing or a refresher course), or trained in, the objectives of the sampling program and the procedures to be used to accomplish those objectives.

Once advised of the objectives and sampling procedures, the sampler must either prepare or obtain the sampling plan and sampling materials. The sampler must know the exact sampling sites or know the exact procedure for selecting those sites. The sampling supplies must be sufficient in quantity and quality for all normally expected occurrences. Provisions should be also made for quality assurance samples, chain of custody forms, and shipping materials for storage.

* When PCB-contaminated office paper has been solvent rinsed, then wipe sampled and bulk sampled, some recent chemical analysis results indicate that the PCB concentration in the surface wipes is not the same as the concentration in the bulk samples. PCB levels in uncontaminated paper were used as a control. The difference in PCB levels in the wipe samples and bulk samples may

be explained by PCB migration into the paper either during cleanup to remove PCBs or during the wipe sampling step.

An important series of quality assurance measures taken before on-site sampling occurs may save considerable expense from collecting contaminated or unusable wipe samples. Sampler training can include practice sampling of surfaces spiked with PCB surrogate compounds, such as tri- and tetrachlorobenzenes to sharpen skills (a) in wiping thoroughly and consistently, and (b) avoiding cross contamination. In addition, before field sampling is conducted, method blanks can be used to verify that sampling equipment supplies and procedures do not introduce PCBs or analytical interferences to the wipe samples. Complete supplies for sampling should be cleaned, a fraction of the supplies sampled individually or through method blanks, and, if clean, the supplies should be protected against contamination or destruction while being transported to the sampling site and while at the sampling site before actual sampling occurs.

The sampler arrives at a sampling site and determines the exact location where the 100 square centimeter (cm^2) sample will be taken. The sample location may be marked or framed by a template. The sampler must be conscious of possibility of cross contamination during all stages of the sampling activity. All surfaces should be wiped with as uniform a pressure as possible. It is important to use the appropriate pressure to thoroughly wipe materials off the surface. Wiping proceeds from left to right in rows from the top to the bottom of the framed sampling area. The sampling area is wiped again with the same uniform pressure in columns from the top to the bottom from the left side to the right side of the entire framed area. It is not critical whether wiping starts at the top left or with rows first and then columns. The objective is to systematically, thoroughly, and consistently wipe the entire framed area twice, each time from a different direction and orientation.

Once the area has been wiped, the sampling gauze is allowed to air dry and is replaced in the sample vial. The sample vial is then labelled, the chain of custody filled out, and the sample prepared/stored for shipping.

Table 1

**SUMMARY OF CLEANUP LEVELS
BASED ON THE EPA PCB SPILL CLEANUP POLICY**

**Requirements for Cleanup of Low-Concentration Spills
Which Involve Less Than One Pound PCBs by Weight
(Less Than 270 Gallons of Untested Mineral Oil
[Containing Less Than 500 ppm PCBs])**

Solid Surfaces (except for all indoor, residential surfaces other than vault areas)	Double washed/rinsed
All Indoor, Residential Surfaces Other Than Vault Areas	10 micrograms per 100 cm^2 by standard commercial wipe tests
Soil	Remove visible traces of the spill and soil within a one foot buffer of the visible traces

Table 2

SUMMARY OF CLEANUP LEVELS
BASED ON THE EPA PCB SPILL CLEANUP POLICY

Requirements for Cleanup of
High-Concentration Spills and Low-Concentration Spills
Involving One Pound or More PCBs by Weight
(270 Gallons or More of Untested Mineral Oil
[Containing Less Than 500 ppm PCBs])

<u>Residential/Commercial/Rural</u>

Indoor (except vaults), and Outdoor High Contact	10 micrograms per 100 cm^2
Indoor Vaults	10 micrograms per 100 cm^2
Outdoor Low Contact	10 micrograms per 100 cm^2
Porous Surface Option	100 micrograms per 100 cm^2 plus encapsulation
Soil	10 ppm Plus a 10 Inch Cap

<u>Restricted Access (Non-Sub-Station)</u>

High Contact Surfaces	10 micrograms per 100 cm^2
Low Contact Indoor Surfaces	10 micrograms per 100 cm^2
Porous Surface Option	100 micrograms per 100 cm^2 Plus Encapsulation
Outdoor Low Contact Surfaces	100 micrograms per 100 cm^2
Soil	25 ppm

<u>Outdoor Electrical Substations</u>

Surfaces	100 micrograms per 100 cm^2

Soil	25 ppm or 50 ppm with Notice

Additional Wipe Sampling Information
(Contents)

An Example of a List of Wipe Sampling Supplies

Copy of Sampling Procedures and Study Objectives

Pen (Indelible Ink)

Pre-numbered Sample Labels

Tape to Cover Labels

Chain of Custody Forms

Screw Top Vials with Teflon Lined Caps
These Vials Contain Pre-Cleaned 3" x 3" Surgical Gauze Pads

Teflon Squirt Bottle for Applying Solvent to Wipes and Washing

Solvent, preferably in a bottle with a volumetric delivery top

Graduated cylinder, when not using a volumetric delivery top

Disposable Gloves

Metal Ruler

Sampling Template

Forceps for Removing (Replacing) Gauze from (into) Vials

Disposable Wipes (for cleaning ruler)

Garbage Bags/Containers (for disposal of gloves and solid waste)

Funnel

Five Gallon Solvent Can for Disposal of Rinse Solvent

Shipping/Storage Containers for Samples

Sampling Site Description Forms with Optional Instant Print Camera

An Example of Sample Site Preparations

At each sample site location:

- Mark the exact sample site with the template or a ruler

- If the site is not easily marked with a template or ruler (an irregular non-planar surface), write a detailed description of the area sampled. A instant print photograph with the ruler included (for scale) is a very valuable descriptor.

- Prepare all necessary forms and sampling logs for entry of the sampling time, date, location, and other information describing the sampling at that particular site.

- Prepare all sampling equipment for sampling the site.

An Example of a Wipe Sampling Procedure

Assume that the exact sampling site has been marked.

1. With gloved hands, remove the cap from the sampling vial.

2. With the forceps, remove the gauze from the sampling vial.

3. From a solvent bottle, use the volumetric delivery device or fill a graduated cylinder with 5 milliliters of solvent to the gauze.

4. Immediately begin applying the gauze using a gloved hand and, applying pressure, wipe the marked area completely twice, from left to right and then from top to bottom.

5. Let the gauze air dry.

6. Fold the dry gauze (sampled side inward) and return it to the sample vial.

7. Cap the sample vial.

8. Remove and discard the gloves.

9. Label the vial and fill out sampling details on the sampling forms.

10. Fill out chain of custody forms and prepare the sample for storage and shipping.

A Detailed Description of Quality Controls for Wipe Sampling Activities

Several kinds of quality control (QC) samples should be used. Each kind of sample provides an indication of the reliability of a part of the sampling and analysis process.

It is better not to identify QC samples as such when submitting the QC samples to the analytical laboratory. It is best to randomly number all samples when submitting them to the analytical laboratory. The chemical analysis laboratory does not need to know sample descriptions except for matrix type or in the event of the presence of an unusually high concentration in the wipe. Specific identification of the QC samples will not be necessary since the concentration range in these samples should be in the normal operating range of the analytical instruments.

Vials refer to the glass vials containing sampling gauze.

1. Field Blanks - at least 5% of the total samples include at least two samples each from the following:

   a. Ship unopened vials back for analysis.

   b. With gloved hands, remove the cap from a sample vial for the estimated time (record this time) of normal wipe sampling, allow the gauze to air dry without applying it to any surface, and proceed with step 7 in the wipe sampling procedure.

   c. Use the wipe sampling procedures to wipe some areas/surfaces near the sampling site but which are not expected to be contaminated.

2. Duplicates - at least 5% of total samples including at a minimum the designated samples from both the following groups:

   a. Double wipe at least two sample sites, label which was the first wipe and which was the second wipe for each of the two sites, for each kind of surface sampled.

   b. For at least two sample sites for each kind of surface sampled, wipe two adjacent identical or nearly identical areas. Clearly identify the samples as being adjacent to one another in the sample description forms.

A Detailed Description of Quality Controls for Wipe Sampling Activities (Continued)

3. Field Spikes - at least 5% of total samples including at a minimum the designated samples from each of the following groups for each kind of surface sampled. Clearly describe these samples on the sample description forms.

   a. For two vials or more, remove each gauze and moisten as for sampling and spike each wet gauze with ten micrograms each of the kind of PCBs which was spilled, wipe a contaminated surface adjacent to a sampled surface as in 2b (above), let the gauze air dry, replace the gauze, and proceed with step 7 in the wipe sampling procedure.

   b. For a second pair of vials or more, remove each gauze and moisten as for sampling, wipe a contaminated surface adjacent to a sampled surface as in 2b (above), after wipe sampling (but before air drying) spike each wet gauze with ten micrograms each of the kind of PCBs which was spilled, let the gauze air dry, replace the gauze in the vials, and proceed with step 7 in the wipe sampling procedure.

   c. For a third pair of vials or more, spike sampling surfaces adjacent to another sampled surface as in 2b (above) with ten micrograms each of the kind of PCBs which was spilled and allow to air dry; remove each gauze and moisten as for sampling; wipe the surface; let the gauze air dry, replace the gauze in the vials; and proceed with step 7 in the wipe sampling procedure.

Wipe Sampling Quality Control Samples (Summary)

1. Field Blanks - At least two samples from each category

   a. For each spill site prepare the following blanks:

      i. Unopened sampling vials containing gauze

      ii. Remove gauze but do not use to wipe

   b. For each kind of surface, wipe an uncontaminated 100 cm^2 surface with a gauze as a blank surface

2. Duplicate Samples - At least 5% of total samples

   a. For each kind of surface at each spill site:

      i. Double wipe at least two sample sites

      ii. Side by side wipe at least two sample sites

3. Spiked Samples - At least 5% of total samples

   a. Wipe no less than two samples each for each kind of surface at each spill site. All are side by side paired samples. One sample for each pair is untreated, for the other sample:

      i. Spike gauze with 10 micrograms of PCBs, then wipe the 100 cm^2 area

      ii. Wipe the 100 cm^2 area first, then spike gauze with 10 micrograms of PCBs

      iii. Spike the 100 cm^2 site with 10 micrograms of PCBs, then wipe

An Example of Quality Assurance Procedures Useful When Conducting Wipe Sampling Activities

1. Designate a person, not the sampler or chemical analyst, who is responsible for quality assurance and quality control including: training, preparation of sampling supplies, wipe sampling, sample preparation/extraction, chemical analysis, analytical data reduction, reporting of the sampling results, and conclusions drawn from the results.

2. Document the objectives of the wipe sampling and subsequent chemical analysis. Include performance requirements such as number of samples required, precision, accuracy, measurable deliverables, and schedules.

3. Develop a quality assurance plan which includes: the objectives; quality assurance/quality control procedures, audits, and schedules; persons responsible for all aspects of the sampling and chemical analysis efforts; references to all safety, training, sampling, and chemical analysis procedures; and corrective actions (including approximate times before corrective actions will occur) to be taken in the event that documented procedures cannot be or have not been followed.

4. Verify that staff doing sampling are the designated staff or suitably trained and informed replacements for the designated staff.

5. Verify that the sampling equipment and the sample gauze/vials are not going to introduce contamination into the samples.

6. Verify that sufficient quality control samples are taken and taken properly, that sampling objectives are met, and that chain of custody procedures are being followed.

7. Verify that sample extraction and chemical analysis occurs according to documented procedures. Assure that suitable and sufficient analytical quality control samples and reference standards are analyzed.

8. Verify that analytical data calculations are properly generated and the data are correctly associated with the proper samples.

9. Assure that conclusions based on the chemical analysis of the samples are in keeping with the sampling procedures and sample site locations.

10. Document quality assurance activities including: who did it, what was done, when it was done, where was it done, and why was it

done. Document and justify any deviations from documented procedures and policies.

An Example of Procedures to Use When Cleaning Wipe Sampling Equipment

1. Using clean (or cleaned) disposable equipment is overall probably more cost-effective than cleaning and verifying that cleaned sampling equipment is free from PCBs. The second choice is not cleaning any equipment on or near the sampling site, but to have sufficient recleaned sampling equipment to completely sample a site. The least favorable situation is to clean sampling equipment for reuse at the same sampling site. If cleaning must be done at or near the sampling site, clean the sampling equipment as far from the actual site of cleanup/contaminations as possible.

2. Try to have sufficient clean materials on-site to completely sample a site (plus at least ten percent surplus for unforeseen accidents and blunders) so as not to have to clean any sampling equipment.

3. Use cleaning procedures which have been verified as effective previously. Good cleaning includes:

   Washing with soapy water
   Rinsing thoroughly with water
   Rinsing three times thoroughly with distilled water
   Rinsing with PCB-free organic solvent
   Air drying for non-glass
   Drying in a muffle furnace at 350°C for glass
   Verification sampling and analysis of cleaned equipment
   Protective packaging for shipment to the sampling site

4. The same kind of verification procedures should be used for new equipment as is used for equipment which has been cleaned:

   a. Selecting a statistical sample from the equipment. For lots having large numbers of units (such as sample bottles), a 5% or less proportion of the units may be sufficient. For equipment which comes in direct contact with contaminated surfaces (such as templates) a 10% sample may be more appropriate unless historical data have verified that a smaller proportion is sufficient.

   b. Rinsing "clean", dry equipment with the same amount of organic solvent as is used in the sampling procedure or more than sufficient solvent to completely cover and rinse off all contact (with the wipe sample, sampler, or the surface) surfaces of equipment. The rinseate is collected and treated as an extract from a sample gauze pad.

   c. The presence of detectable levels of PCBs indicate that contamination is present and that the lot from which the verification sample(s) came must be either recleaned and reverified or disposed of appropriately.

II. DESCRIPTION OF DOUBLE WASH/RINSE

Introduction

The PCB Spill Cleanup Policy requires that low concentration spills of small amounts of PCBs on surfaces are to be removed by a double wash/rinse procedure. The objectives of the double wash/rinse are (1) to recognize the lesser hazard resulting from these small quantity spills and from the cleanup of such spills, and (2) to remove the easily removable PCB material thoroughly and quickly. It is also important not to redistribute PCBs or leave pieces of cleanup materials as a result of the cleanup procedure.

General Requirements for All Double Wash/Rinse Surfaces

For spills where there is still visible PCB-containing liquid present on the surface to be cleaned up, the double wash/rinse procedure first requires a pre-cleaning step. This step includes thoroughly wiping/mopping up the entire surface with absorbent paper or cloth material, such that there are no longer visible signs of the liquid present on the surface.

The double wash/rinse procedure called for in the cleanup of surfaces contaminated by small spills includes the two washing steps and two rinsing steps. The two washing and rinsing steps are slightly different depending on: (a) whether a contaminated surface was relatively clean before the spill, or (b) whether a surface was coated/covered with some sort of absorbent material, such as dust, dirt, grime, or grease.

Minimization of residual PCBs following the double wash/rinse procedure is facilitated by the proper selection and use of cleanup equipment. Scrubbers and the absorbent pads used in the double wash/rinse procedure shall not be dissolved by solvents or cleaners used. Scrubbers and absorbent pads shall not contain greater than 2 parts per million (weight per weight) PCBs. Washing scrubbers and absorbent pads shall not be reused. Rinsing scrubbers and absorbent pads may be reused as washing scrubbers or absorbent pads if necessary, but this is not recommended. All double wash/rinse cleaning/absorbent materials must remain intact (i.e. do not shred, crumble, or leave visible fragments on the surface) after the double wash/rinse operation.

During the double wash/rinse process, all washing and rinsing liquids/solvents must be contained, captured, and properly disposed of in accordance with local, state, and Federal regulations. Following use in the double wash/rinse process, all double wash/rinse equipment and absorbent materials must also be disposed of in accordance with local state, and Federal regulations.

Summary of The Double Wash/Rinse Procedure

General

1. Use disposable cleaning materials which do not

   - dissolve or break apart
   - contain traces of PCBs.

2. Remove any visible PCB liquid before washing/rinsing.

3. Capture and contain washing/rinsing solutions.

4. Properly dispose of cleaning materials and solutions/liquids.

Specific

1. For surfaces not covered with dirt, dust, grime, grease or other potential absorbent of PCBs:

   WASH 1: Scrub with organic solvent and wipe up the solvent.

   RINSE 1: Wipe surface with moistened pad, wipe up with dry pad.

   WASH 2: Repeat WASH 1.

   RINSE 2: Repeat RINSE 1.

2. For surfaces covered with dirt, dust, grime, grease or other potential absorbent of PCBs:

   WASH 1: Scrub with detergent and water, dry.

   RINSE 1: Rinse with water, wipe with wet adsorbent pad, dry.

   WASH 2: Scrub with organic solvent and wipe up the solvent.

   RINSE 2: Wipe surface with moistened pad, wipe up with dry pad.

Detailed Requirements for the Double Wash/Rinse

1. Specific requirements for surfaces that do not appear dusty or grimy before a spill, such as glass, automobile surfaces, newly poured concrete, and desk tops:

WASH 1.

If there is no visible liquid or after having removed the visible liquid, cover the entire surface with organic solvent in which PCBs are soluble to at least 5% by weight. Contain and collect any runoff solvent for disposal. Scrub rough surfaces with a scrub brush or disposable scrubbing pad. Add solvent such that the surface is always very wet for one minute per square foot. Wipe smooth surfaces with a solvent-soaked, disposable absorbent pad for one minute per square foot. Any surface less than one square foot shall also be washed for one minute. Wipe, mop, and/or sorb the solvent onto absorbent material until no visible traces of the solvent remain.

RINSE 1.

Wipe the surface with an absorbent pad soaked with the same organic solvent with a solvent-soaked, disposable absorbent pad for one minute per square foot. Any surface less than one square foot shall also be washed for one minute. Immediately wipe/sop up the solvent on the surface with a dry absorbent.

WASH 2.

Repeat WASH 1.

RINSE 2.

Repeat RINSE 1.

Detailed Requirements for the Double Wash/Rinse (Continued)

2. Specific requirements for dirty, dusty, grimy, or greasy surfaces or surfaces having surface coverings of some other kind of sorbant materials (where the spill probably largely sorbed onto the materials on the surface):

WASH 1.

If there is no visible liquid or after having removed the visible liquid, cover the entire surface with concentrated or industrial strength detergent or non-ionic surfactant solution. Contain and collect all cleaning solutions for proper disposal. Scrub rough surfaces with a scrub brush or scrubbing pad, adding cleaning solution such that the surface is always very wet, for one minute per square foot. Wipe smooth surfaces with a cleaning solution-soaked disposable absorbent pad for one minute per square foot. Any surface less than one square foot shall also be washed for one minute. Mop up or absorb the residual cleaner solution and suds with an absorbent pad until the surface appears dry. This cleaning should remove any residual dirt, dust, grime, or other sorbant materials left on the surface following step one (above).

RINSE 1.

Rinse off the wash solution with one gallon of water per square foot and capture the rinse water. Mop up the wet surface until the surface appears dry.

WASH 2.

Next, cover the entire dry surface with organic solvent in which PCBs are soluble to at least 5% by weight. Scrub rough surfaces with a scrub brush or scrubbing pad adding solvent such that the surface is always very wet for one minute per square foot. Wipe smooth surfaces with a solvent-soaked, disposable absorbent pad for one minute per square foot. Any surface less than one square foot shall also be washed for one minute. Wipe, mop, and/or sorb the solvent onto absorbent material until no visible traces of the solvent remain.

RINSE 2.

Wipe the surface with an absorbent pad soaked with the same organic solvent as in RINSE 1 (above) and immediately wipe up the solvent on the surface with a dry absorbent.